AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

Volume 85
Number Eleven
$1.00 a Year.

SEPTEMBER, 1921

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

A Year of Progress

IN THE twelve months just passed there have been added to the list of "National" products some twenty-eight technical dyes. These additions do not represent the whole development that has been carried on in our Research Laboratories, but only those new dyes that have been put into standard production and are now offered to the trade.

New "National" Dyes

(*Introduced Since September, 1920*)

National Alphazurine A
National Alphazurine 2G
National Acid Fast Violet BG
National Wool Green S
National Quinoline Yellow
National Alizarine Sapphire FS
National Brilliant Green B Crystals
National Wool Yellow LF
National Wool Blue CG
National Wool Orange R Conc.
National Ponceau R
National Superchrome Yellow GN
National Diazine Beta Black N
National Diazine Black V
National Erie Fast Gray R
National Niagara Blue R
National Niagara Blue HW
National Niagara Blue RW
National Niagara Sky Blue 6B
National Erie Fast Orange A
National Erie Fast Orange CG
National Erie Fast Scarlet YA
National Erie Fast Scarlet 4BA
National Erie Fast Scarlet 8BA
National Erie Fast Red 8BLN
National Erie Yellow Y
National Napthol AS
National Sulphur Blue LRR

We offer this record of progress to the great textile and other color using industries of America as evidence that the "National" is determined to contribute its share toward the establishment of American dyes and the up-building of the dyestuff industry.

National Aniline and Chemical Co., Inc.

21 Burling Slip, New York

Akron
Boston
Chicago
Hartford
Charlotte

THE FIRST AND LARGEST MAKERS of COAL-TAR DYES IN AMERICA

NATIONAL U.S.A. DYES

Montreal
Toronto
Providence
Philadelphia
San Francisco

NATIONAL DYES

Table of Contents, page 41. Advertisers' Index, page 296. Buyers' Index, page 284

MILL WHITE PAINT

For Progressive Mills

Mill White will not yellow, flake off, or collect dirt. It may be washed like tile and withstands the vibration of the heaviest machinery.

Three Finishes
Flat, Eggshell and Gloss

Can be brushed or sprayed.

Manufactured by

The Patterson-Sargent Company

New York Cleveland Chicago St. Paul Kansas City

MIRROR DROP WIRES

TRADE-MARK REG. U. S. PAT. OFF.

Having greatly improved the finish of our Northrop Loom Drop Wires we have adopted the trade-mark

MIRROR

to identify the drop wires of our manufacture and each shipment will contain a slip bearing this trade-mark.

We request our Northrop Loom customers to look for this name which will guarantee the high quality of the drop wires.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

ATLANTA GEORGIA

Copyright 1917 by Draper Corporation

Air Conditioning Equipment that Guarantees the Ideal Inside Climate all the Year 'Round

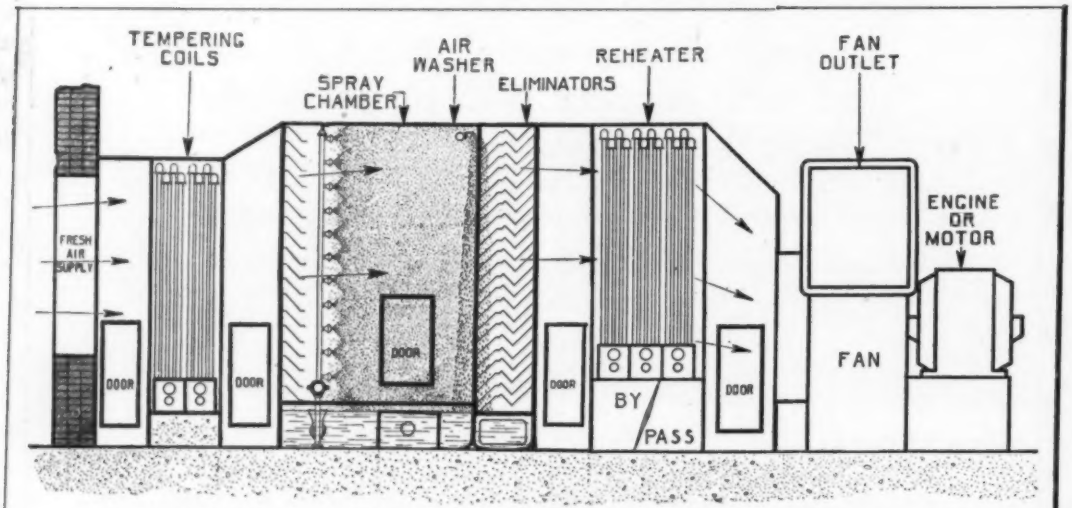
AIR CONDITIONING is the road to results, the aid to production, the safeguard to quality, the important saver of time, the provider of health and satisfaction to the workers, the **efficiency producers,** unvarying in performance, which a score of different industries depend upon for increasing production and profits.

STURTEVANT has brought the new science of "Air Conditioning" to the aid of the textile industry, thereby stimulating production and health. As "Air Specialists" and "Climate Doctors" apparatus and systems have been perfected that **guarantee** ideal climatic conditions **inside** textile plants regardless of outside weather. In summer, dry, cool air is furnished; in winter, moist, warm air. By furnishing just the proper moisture content to the air at all times, static electricity is eliminated, thereby minimizing breaks with their resultant delays, shutdowns, and production loss. Humidified air also adds sufficient weight to the "fly" or "fluff"—which saturates the atmosphere and injures the health and efficiency of workmen—to carry it to the floor where it is easily swept up. A Sturtevant Air Conditioning System in your plant will immediately boost production and health.

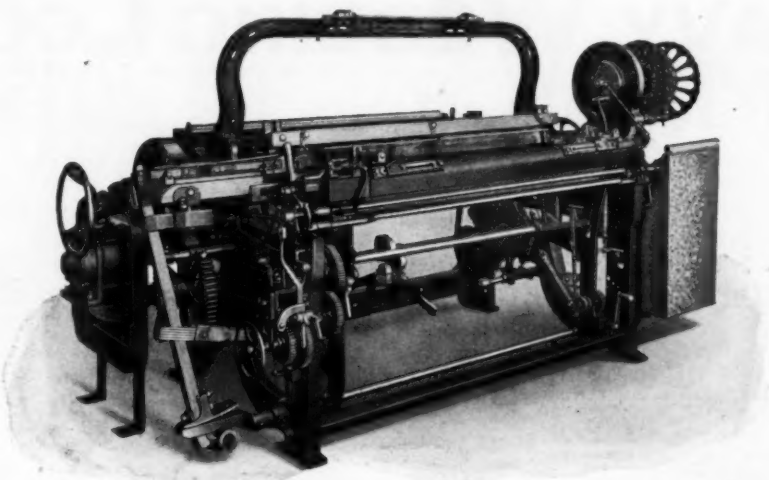
This is the mark of the W. L. Fleischer engineering and construction organization of New York, who join their expert field ability with the Sturtevant high standard of design and construction, and who guarantee to you satisfaction in the installation of air-conditioning systems. Request a representative to study your problem. A plan and an estimate will be submitted without obligation. Write the nearest of our 23 Sales Engineering Branches.

B. F. STURTEVANT COMPANY

HYDE PARK, BOSTON, MASS., AND ALL PRINCIPAL CITIES



A typical Sturtevant Heating, Ventilating and Air Conditioning System



Stafford automatic bobbin-changing loom with high take-up roll.

Stafford Looms Increase Production

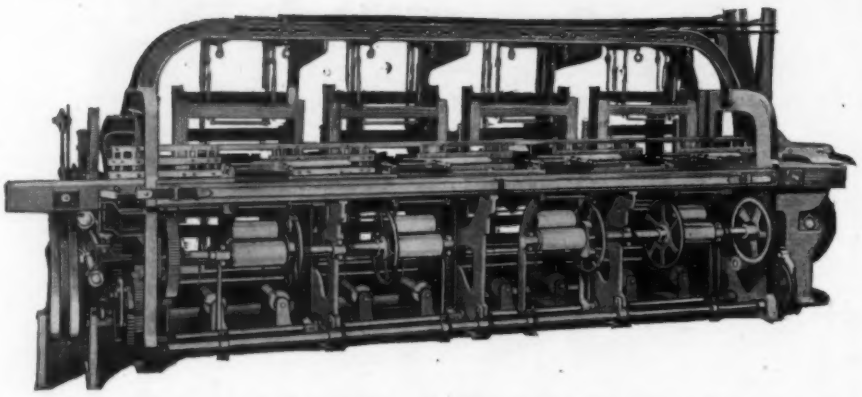
We manufacture a complete line of automatic looms, both shuttle and bobbin-changing for weaving practically every type of fabric that can be made with a single shuttle. ¶ Stafford shuttle-changing looms will handle cop filling just as successfully as bobbin filling. We have a loom for every kind of yarn, coarse or fine, and for practically every variety of fabric, plain or fancy.

THE STAFFORD COMPANY
WEAVING MACHINERY
READVILLE, MASS.
Southern Agent—J. H. MAYES, Charlotte, N. C.

PATERSON OFFICE
502 COLT BLDG.
PATERSON, N. J.

CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL

FLETCHER
HEAVY WEBBING LOOMS



are the Standard for Weaving Solid Woven Belts and Asbestos Brake Lining.

Never was the time more opportune to survey your weaving machinery equipment and tune it up for high pitch production at the lowest possible cost.

The time for economical production is here. There is no machinery investment you can make which yields so great a return—dollar for dollar—as FLETCHER WORKS (Schaum & Uhlinger) Looms.

These looms are of rigid construction
Are compact and easily operated
Are reliable under all conditions
Are finished with the time, material and labor saving devices for which this house has been noted since 1850.

Our engineers are at your call to help you in a survey of your plant.

FLETCHER WORKS

(FORMERLY SCHAUM & UHLINGER)

Glenwood Avenue, at Second Street, Philadelphia, U. S. A.

Also Manufacturers of

FLETCHER HIGH SPEED RIBBON LOOMS **FLETCHER ELASTIC WEBBING LOOMS**
FLETCHER COTTON TAPE LOOMS **FLETCHER CENTRIFUGAL EXTRACTORS**
FLETCHER MULTICONE CLUTCH

WHITIN MACHINE WORKS

ESTABLISHED 1831.

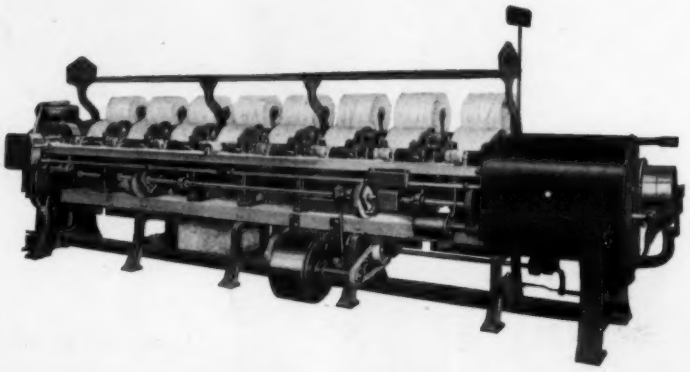
TEXTILE MACHINERY

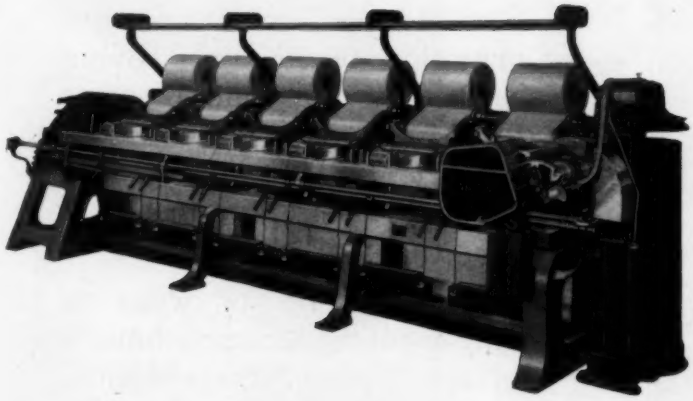
Makers of

COTTON COMBING MACHINES

Meeting all requirements of Textile Manufacturers

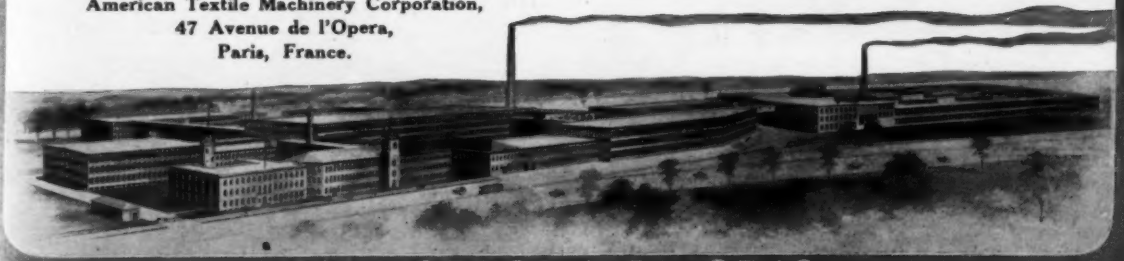
Model D-2 Comber
Whitin Type





Model E. Comber
Nasmith Type

European Agent:
American Textile Machinery Corporation,
47 Avenue de l'Opera,
Paris, France.



MAIN OFFICE AND WORKS

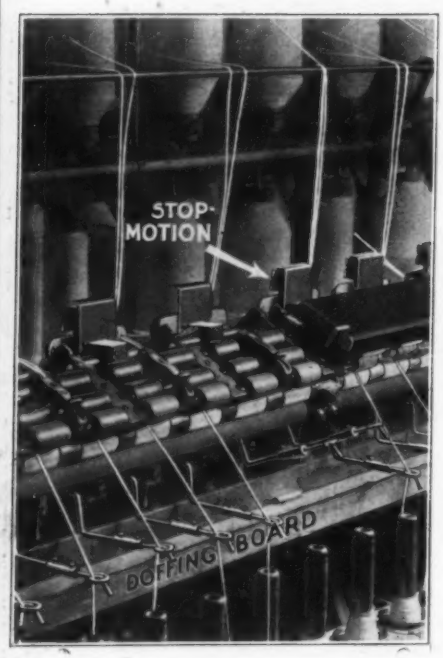
WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE, N.C.

AUTOMATIC STOP-MOTION DEVICE

for

SPINNING AND TWISTING



Here is a *new* device which the instant the end breaks the Stop-Motion operates automatically, severs the roving back of the rolls and prevents the formation of waste. Practically *all* of the roving is converted into yarn.

The prevention of waste is only *one* of the accomplishments of the Eclipse Stop-Motion. Let us tell you more about it. Write us.

ECLIPSE TEXTILE DEVICES, Inc.

Elmira, N. Y.

Modern Efficiency Demanded
Pressed Steel Construction

Why are the most famous engineers using pressed steel construction on automobiles, aeroplanes, trucks, tractors, ships, etc.? Consideration of lightness, strength and durability dictates it.

Pressed steel construction is used in Mossberg All-Steel Section Beam Heads because we realized the need for a lighter weight and stronger beam head. Now, when costs must be cut in every way possible, should you be interested in the new

MOSSBERG

Pressed Steel Corporation

ALL STEEL SECTION BEAM HEAD

which is a recent development and superior in design, utility, workmanship and durability to any other beam head now on the market. It is the result of careful experimenting and design.

Being 25% lighter in weight than the average cast-iron beam head it is obvious that it saves much time and labor in handling, not to speak of the loss of time necessary to rewind and replace a broken head in case of an accidental drop.

It will not warp, crack nor break—will not bend or spring when the yarn is wound on the beam—will stand the roughest usage and is guaranteed not to break. It of course saves freight charges when beams are shipped between mills.

Let us tell you how it is made. Write for the full story.

Mossberg Pressed Steel Corporation

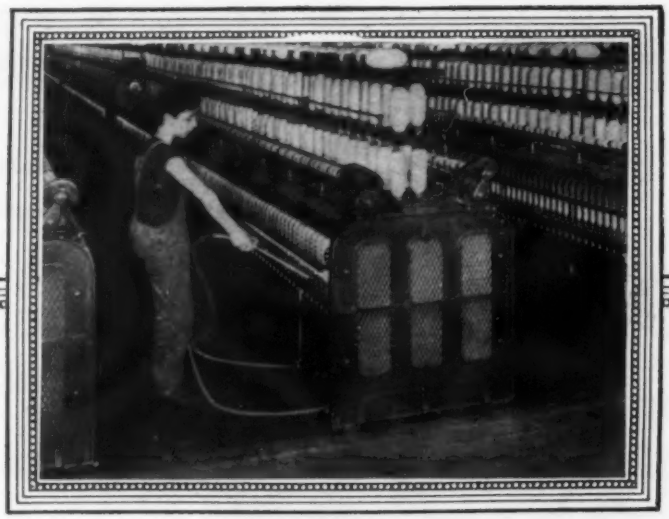
Attleboro, Mass.

Manufacturers of

Pressed Metal Section and Loom Beam Heads, Spools, Reels, Beams, Jack Spools and "New Process" Drop Wire

Southern Representatives

Walraven Co., 38 W. Alabama St., Atlanta, Ga.



Increase Production

Don't Stop the Spinning Frame or Loom Clean By Compressed Air and Keep Running

Parko Air Cleaning is a by-product of the Turbo Humidifier system. But it is not essential that the two go together. Compressed air cleaning pays, even if your humidifying system is not of the compressed air type.

Note the advantages

Cleaning accomplished more thoroughly and in less time than by other methods.

Cleaning with machine in motion without danger to operative.

All departments kept cleaner—better product and less fire risk.

The best method of cleaning *electric motors* yet devised is by the use of compressed air.

Air cleaning and accessories have been developed by us into a complete line. *Write for our booklet.*

Parks-Cramer Company

Engineers & Contractors

Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

Simplicity and Maintenance Economy Will Be Realized By Specifying Cutter Holder-Socket-Reflector *This*

Standard Reflector-Socket

Plus any of These Three

Standard Angle Type Reflector

R.L.M. Standard Dome Type Reflector

Standard Bowl Type Reflector

make a complete reflector unit—a unit that will efficiently meet every requirement

Illuminating engineers recognize that only the RLM Dome, Bowl and Angle types of reflectors are necessary for the proper directing of light to meet every combination of industrial requirements.

It is, therefore, very evident that the simplicity of the Cutter line of industrial lighting equipment is a great factor in reducing not only the initial cost of installation but in reducing the cost of necessary renewals and maintenance.

Cutter industrial lighting equipment and Westinghouse Mazda lamps make a combination that will provide standard light intensities at a minimum cost.

Write the nearest Westinghouse district office, or

Westinghouse Electric & Mfg. Co.
George Cutter Works
Southe Bend Indiana

WESTINGHOUSE ELECTRIC

Westinghouse

Howard Bros. Mfg. Co.

Established 1866

WORCESTER, MASS.

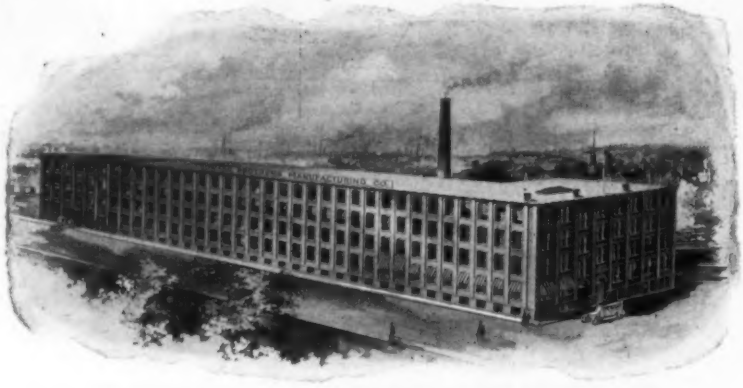
ATLANTA, GA.
Agent
E. M. TERRYBERRY
1126 Healey Bldg.

PHILADELPHIA, PA.
Agent
JOSEPH A. BOLGER,
4925 Royal St.
Germantown.

CARD CLOTHING

Napper Clothing

Heddles for any loom



Card clothing for cotton, woolen and worsted cards.

Cylinder Fillets
Top Flats Reclothed

Doffer Fillets
Stripper Fillets

Burnisher Fillets

Napper Clothing for All Styles of Machine and Cloth

Midgley's Improved Hand Stripping Cards, All Lengths and Sizes

QUALITY AND SERVICE ALWAYS GUARANTEED

Keep Them Linked Together In Your Mind

BY MAKING humidification our special study for 33 years, and giving our whole attention and efforts to this one subject, we have perfected and standardized our systems, until they are now recognized by men who know—mills that have compared systems—as the only source to secure PERFECT conditioning of air.

Humidification is only profitable to the mill when a judicious selection of the system is made and specialized experience used in its installation. Otherwise, the whole equipment may have to be rearranged or discarded.

Our systems are standardized—each one designed to meet one specific requirement. We do not believe in exploiting the merits of one method alone and claiming weaknesses and faults in all others, but our practice is to recommend the system that is best suited. We make a specialty of re-vamping old equipments, bring defective or antiquated systems to the highest possible efficiency.

Perfect air conditioning and American Moistening Systems are synonymous—keep them linked together in your mind.

No matter how perfect you may think your present system is—only specialists with years of experience can detect the faults if they exist, and our reputation is sufficient guarantee that we never specify equipment other than is needed to bring the system to top-notch efficiency.

Make us "show you." Ask for our interesting data today.

EQUIPMENT TO MEET EVERY SPECIFIC REQUIREMENT

COMINS SECTIONAL HUMIDIFIERS
FAN TYPE and HIGH DUTY HUMIDIFIERS
VENTILATING Type of Humidifiers (Taking fresh air into the room from outside)
ATOMIZERS or COMPRESSED AIR SYSTEM
COMPRESSED AIR CLEANING SYSTEM
CONDITIONING ROOM EQUIPMENT
AUTOMATIC HUMIDITY CONTROL (Can be applied to systems already installed)
AUTOMATIC TEMPERATURE CONTROL

AMERICAN MOISTENING COMPANY
1888-1921

BOSTON, MASS. ATLANTA, GA.

Factory Representatives:
W. R. GRACE & CO., New York South America
ANDERSEN, MEYER & CO., Shanghai, China
W. J. WESTAWAY & CO., Hamilton, Canada

GREIST

LOOM DROP WIRES

MADE of special Heddle Wire, Greist Drop Wires are given a "Satin Finish" by an exclusive process. They are also furnished copper or nickel-plated.

In addition to our many standard designs, we are prepared to make drop wires from your own specifications.

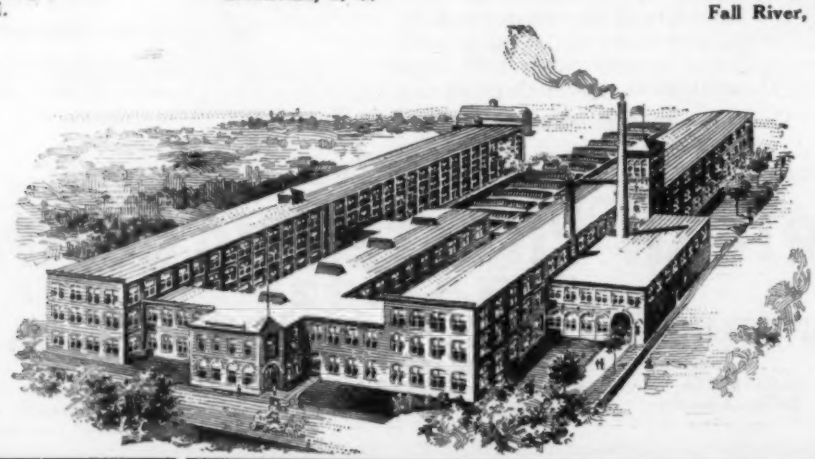
The manufacturing facilities of the Greist Manufacturing Company, since 1871 the largest maufacturers in the world of sewing machine attachments, are a dependable source of supply to rely upon for drop wires.

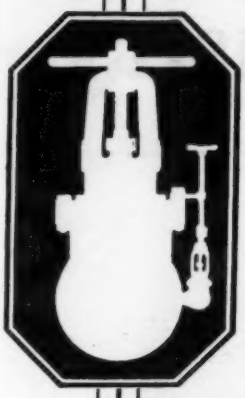
THE GREIST MANUFACTURING COMPANY
Department C, ∴ New Haven, Connecticut

New England Representative:
Boyd's Textile Bureau,
F. W. Boyd, Manager.
339 Butler Exchange,
Providence, R. I.

Southern Representative:
The G. G. Slaughter Machinery Company
Greenville, S. C.

Fall River and New Bedford:
Caldwell Gildard Company,
108 Hartwell Street,
Fall River, Mass.





LUNKENHEIMER
"Victor" Gate Valves

See our Exhibit at the SEVENTH NATIONAL EXPOSITION CHEMICAL INDUSTRIES New York City Sept. 12-17 1921

Dependable performance is the service record of LUNKENHEIMER Iron Body Bronze Mounted "VICTOR" Gate Valves. The "VICTOR" solid wedge disc, double-faced and guided in its travel, is the most practical design of Gate Valve construction. It eliminates "dragging" across the seatring faces and the consequent wear prevalent in valves employing loose parts.

Highest quality materials, coupled with the LUNKENHEIMER method of manufacture; bearings bronze bushed to minimize wear; all parts, including the seatrings renewable, and the indestructible gasket between the bonnet and body flanges, all tend to enhance their value and insure longevity.

Made in both Inside Screw Stationary Stem and Outside Screw Rising Stem types, in four weights for pressures ranging from 100 to 250 pounds. Also in Quick-opening Sliding Stem type for pressures from 125 to 50 pounds, depending on the size.

"VICTOR" Gate Valves are also made in Bronze for pressures up to 250 pounds and in Cast Steel for pressures up to 350 pounds and temperatures to 800° F.

Specify LUNKENHEIMER "VICTOR" GATE VALVES and insist on their installation.

Distributors of LUNKENHEIMER Products situated in every commercial center.

THE LUNKENHEIMER CO.
"QUALITY"
LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD
NEW YORK CHICAGO CINCINNATI BOSTON LONDON
EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

CURRENT EDITION OF CATALOG BEARS No 58 COPIES PROCURABLE FROM LUNKENHEIMER DISTRIBUTORS

6-23-10

To The Textile Industry

The biennial INTERNATIONAL TEXTILE EXPOSITION will be held at Boston, OCTOBER 31st to NOVEMBER 5th.

The unprecedented demand for space is evidence that this will be the largest and most complete Exposition ever held.

MECHANICS BUILDING
Home of the International Textile Exposition
October 31st to November 5th

THE INTERNATIONAL TEXTILE EXPOSITION is an ideal place for buyer and seller to meet—and permits the practical demonstration of new and improved machinery, appliances and accessories.

This is your opportunity to present your message to the TEXTILE Manufacturers—Chalk down the date NOW—OCTOBER 31st to NOVEMBER 5th and the place MECHANICS BUILDING, Boston, Mass., and then write for further particulars to

CHESTER I. CAMPBELL
Director
5 Park Square Boston

Auspices of the Textile Exhibitors Association, Inc.

The Cloth Regain Process That Insures Maximum Profits from your Products

EVERY textile manufacturer knows that from 8% to 15% of the normal weight of their product is due to the atmospheric content, and realizes the importance of restoring the cloth to its maximum atmospheric condition in order to regain weight and dimension and improve the handle and appearance.

The spraying method of regain has never proved satisfactory. Room humidification is insufficient, especially when cloth is rolled or piled.

The regain process that insures perfect results and maximum profits from your products is to be found in the

Manufacturers Cooling and Conditioning Machine

This is a patented process, based on the operation of natural laws and its efficiency has been proven in many mills.

There is no possibility of the product treated taking on more than the normal content, the degree of humidity in the machine being always under 100%.

In addition to the gain in weight, there is a permanent gain in dimension. Static electricity is removed. Variations in color are often caused by variation in cooling time, a quick oxidation generally giving a darker shade than slow oxidation. Consequently cloth allowed to cool in the roll often shows darker on the edges than inside. Treating the goods by our process entirely obviates this. Goods to be calendered should be cool and in normal condition to give best results. This process cools rapidly and uniformly and will not disturb or damage the most delicate finishes.

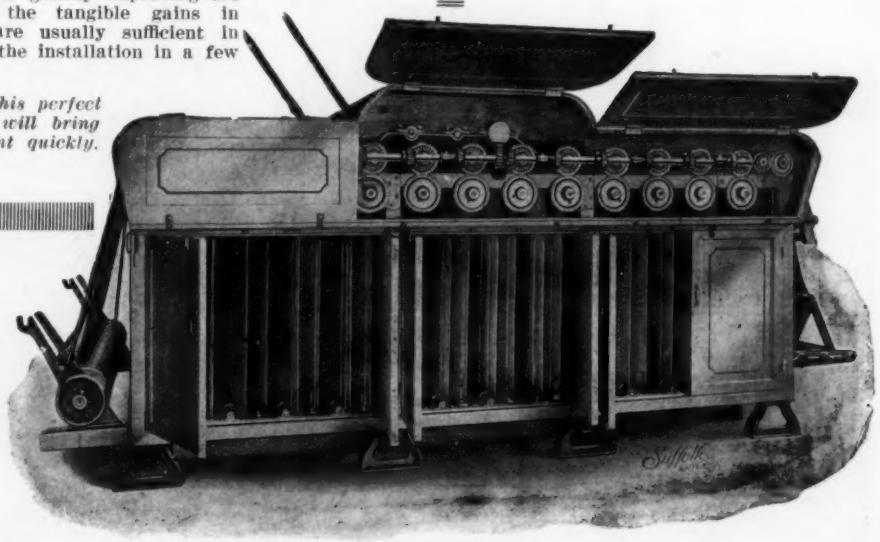
This patented process should be a part of the equipment of every mill. In addition to greatly improving the appearance and handle, the tangible gains in weight and dimension are usually sufficient in money value to pay for the installation in a few weeks' operation.

Let us tell you about this perfect process. Your request will bring the information you want quickly.

—increases weight and dimension to the maximum

—assures perfect and uniform finish and color

—eliminates static electricity thus improving handle.



Manufacturers Machine Company

Sales Department

120 Milk Street,
Boston, Mass.

Factory:
North Andover, Mass.

Before spending any more money on picker sticks, ask us to send you a supply of free samples. They will only cost you the price of a two-cent stamp and you will soon learn how to save money on your loom-supply bills. It is well worth your time to write us today.

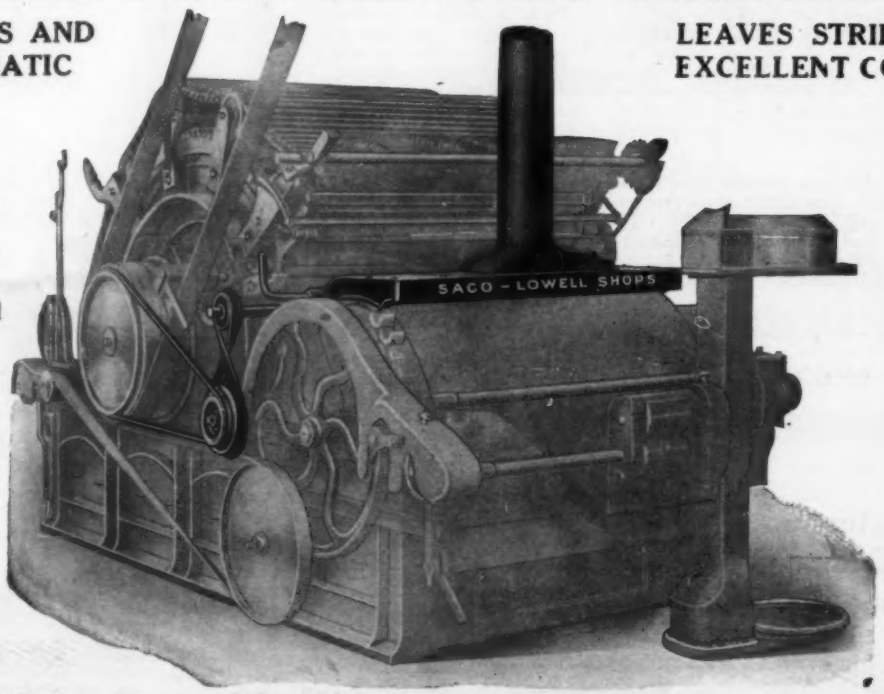
Southern Bending Company

Johnson City, Tennessee

SACO-LOWELL CARD STRIPPER

DUSTLESS AND AUTOMATIC

LEAVES STRIPPINGS IN EXCELLENT CONDITION



Economical to Operate

Saves Time and Labor

Strips Card Clean

Sanitary and Efficient

Low Cost of Maintenance

Simple, Durable, Practical

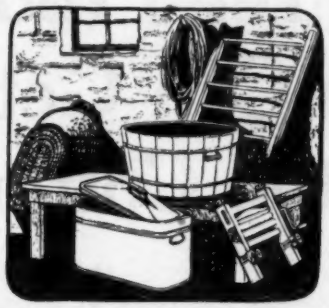
Control Always Absolute

Full Information Furnished

Rogers W. Davis, Southern Agent
CHARLOTTE, N. C.

Saco-Lowell Shops, Newton Upper Falls, Mass.

Southern Branch Office
GREENVILLE, S. C.



Taking the Tub Tax off of Mill Labor . .

They're taking the tub tax off of labor in southern textile mills.

Progressive executives are finding that it pays, and contented employees, with more to live on and for, cheerfully agree with them.

Weekly wash-day has been erased from the domestic calendar. Women workers no longer are required to rob the mills of a day or two each week in order that the wash-tub may be served.

Cleaner clothes, happier homes, greater production, enhanced earning capacity, increased thrift and a higher morale have been promoted through the installation of American Mill Village Laundries.

The American Mill Village Laundry is a strictly modern, thoroughly complete laundry plant designed to launder the clothes for an entire industrial community.

It asks no charity—it pays its own way all the time. In many instances, in fact, the mill village laundry is earning a clear profit of from 10 to 20 per cent on the investment.

Why submit longer to wash-day lay-offs in your mill? Why submit longer to a tub tax on *your* mill labor?

This drain on productive efficiency can be eliminated entirely; your labor turnover greatly reduced, and the lasting gratitude and loyalty of your working personnel won by the installation of an American Mill Village Laundry.

Have our engineers submit a plan for you—it will cost you nothing. Write us today for details.

The American Laundry Machinery Company

Specialty Department C, Cincinnati, Ohio

This composite factory group shows the manufacturing plant of The American Laundry Machinery Company, the world's largest producer of laundry equipment, and originator of the American Mill Village Laundry. The service of this organization is sold with every American Mill Village Laundry installation.

Free Proof That You Can Get Business From the Cotton Mills

From $75.00 to $3,000 or more a week—that is what I did for more than one firm. Another firm says I will be worth possibly $10,000 to them. "Our business was increased $25,000 a year" another informs us. A well-known mill supply house reports an increased business of $2,000 the first week they used me. Does that sound good?

The truth is—to add $75.00 to $3,000 a week to any firm's business is commonplace for me. I'm doing it for hundreds of firms.

Why not let me show you the fertile and extensive markets at your command, the names of buyers of your products? I'll show you just how to reach them, explain the difference in the size of one textile establishment from another, tell you their capital, number of looms or other machines they operate, how many they employ and kind of power they use. I'll quietly advise you each superintendent's, treasurer's and other official's name, how long each mill has been in business, what they make, who sells it in New York or other sales points, and I'll show you what railroad reaches each mill.

Besides all this, I know and am able to tell you every mill making the same kind of goods or yarns as other mills, so you may either sell all competitors of your present customers, or buy from many manufacturers making the same article.

Listen—I am able to do all this and more, because I've been at it for thirty-five years. I'm not one, but an organization of trained specialists, older experienced business men, middle aged live wires with fifteen to twenty years' association and actual contact with the textile industry, keen minded young women who have particular training for this exacting work, and young, energetic, clean cut travelers who know all branches of the textile trade.

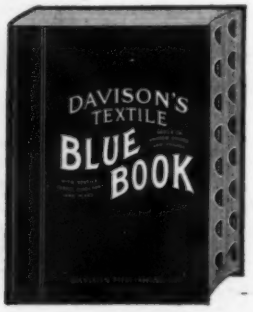
So helpful am I in my assistance to any firm, that my publishers gladly send me on approval to any responsible firm. Order the 1921 edition today. It will be one of the most important things you ever did to help increase your business.

Yours for success,

Davison's Textile Blue Book

50 UNION SQUARE—NEW YORK

Office Edition	$7.50
Handy Edition	5.00
Salesmen's Edition	4.00
(Prepaid)	



A leaflet with full description sent on request.

SPECIALISTS IN MARKING MACHINES

Carton Marker

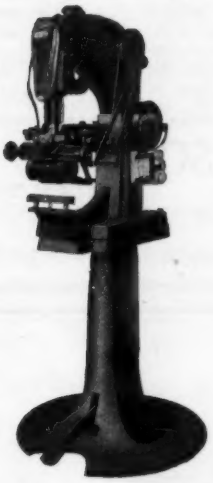
The Carton Marker is for printing the size, descriptive names or colors, style numbers, or lot numbers, on the carton or the label, giving an absolute uniform result on all your containers; eliminating the poor and blurry mark that is usually obtained by the use of hand stamps.

Over 500 of these equipments are in operation.

Is adapted for marking the set-up, folding or telescopic carton .

Price of standard equipment, $300.

Textile Marker



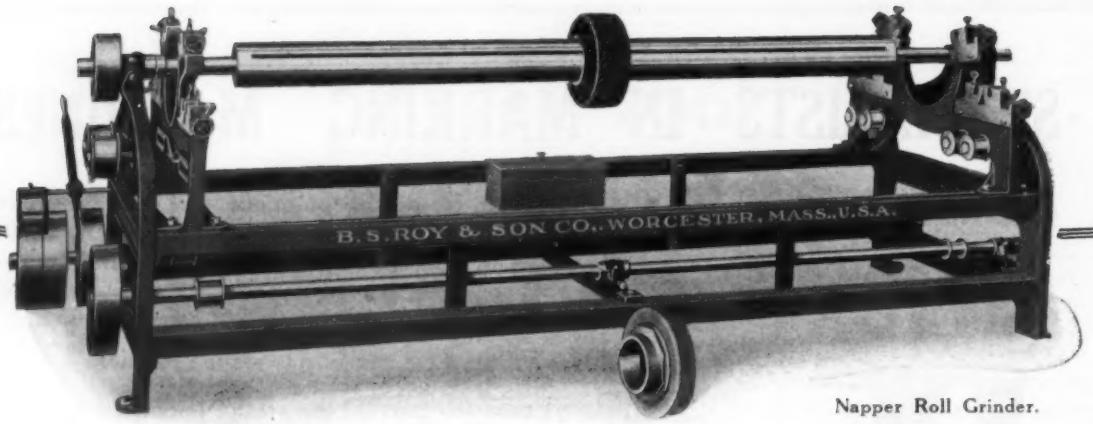
The standard Textile Marker designated as an M-5 equipment, is for placing identification marks on pieces before going into the dye, bleach and finish, or any other operation in which the material requires marks for identification purposes, eliminating any possibility of error or short measure. Gives you a true check on your yardage. Price for standard equipment, $300.

Coupon Marker

The Coupon Marker, used in connection with piecework pay-roll systems, where the coupon method is operated. Prints at the rate of 375 a minute. Has rotating type wheels which enable the operator to set various numbers at will, and is the solution for marking where this system is installed. There are over 400 of these in use.
Price of standard equipment, $250.

MARKEM MACHINE CO.

232 Summer St., BOSTON, MASS.



Napper Roll Grinder.

"Common Sense"

A mill man that keeps his napping and carding machinery in the best condition is showing good "common sense." Such machinery in any mill represents a considerable investment, which investment should be protected by keeping it paying dividends.

The man who selects Roy Grinders to protect his investment is also showing some good "common sense." He figures that the grinder that is selected by the largest mills in the country must necessarily be the best.

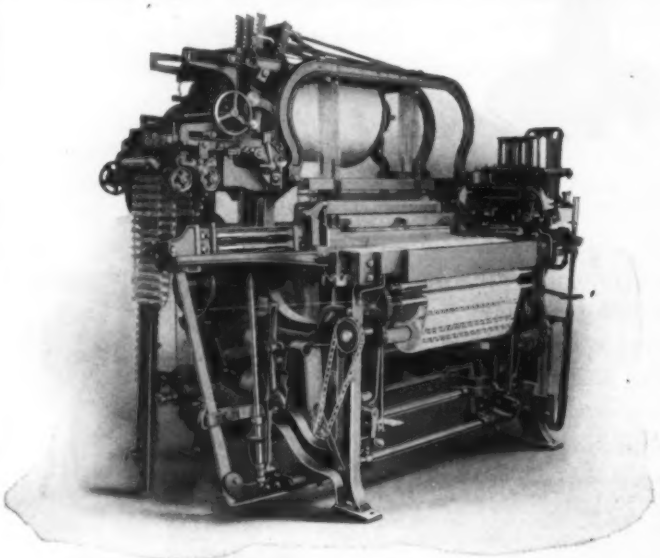
We are at your service in solving grinding problems. Write for catalog.

B. S. ROY & SON CO., Worcester, Mass.

ESTABLISHED 1868

Southern Agent
E. M. TERRYBERRY,
1126 Healey Bldg., Atlanta, Ga.

Canadian Representative
W. J. WESTAWAY CO., LTD.,
Hamilton, Canada



Automatic Terry Towel Loom

The AUTOMATIC TERRY TOWEL LOOM shown here, is of the Dobby type and is used for weaving towels with colored borders.

A large number of these looms are running successfully with increased production per weaver and greatly reduced operating costs.

CROMPTON & KNOWLES LOOM WORKS

—WORCESTER, MASS.—

PROVIDENCE, R. I. PHILADELPHIA, PA. PATERSON, N. J.

ALEXANDER & GARSED—Charlotte, N. C.—Southern Representatives

American Textile Machinery Corp., 47 Ave. de l'Opera, Paris—Representatives for Continental Europe

Tell the World What You Are Manufacturing

TEXTILE PRODUCTS SHOW OCTOBER 6th to 12th, INCLUSIVE, TEXTILE HALL, GREENVILLE, S. C.

Yarns and threads of various colors and sizes. Cloths of every kind. Garments and articles in infinite varieties made from yarn and cloth. Exhibits are desired from manufacturers, commission agents, converters, garment makers and others.

Imported goods and fabrics will be shown. The Department of Agriculture will display its cotton standards. The Department of Commerce will lend its collection of cotton fabrics. A New York collector will send a large number of ancient specimens of cotton cloth, some four thousand years old.

Visitors will include foreign importers, domestic exporters, business men in various textile lines, representatives of the largest dry goods houses, wholesalers, jobbers, and retailers in the dry goods and clothing trade.

The City of Greenville has made extensive arrangements to house all visitors comfortably.

We sincerely invite manufacturers to cooperate by taking space. Such an opportunity to meet buyers has never been offered. Write to Space Committee.

TEXTILE HALL, GREENVILLE, S. C.

Wooden Packing Cases

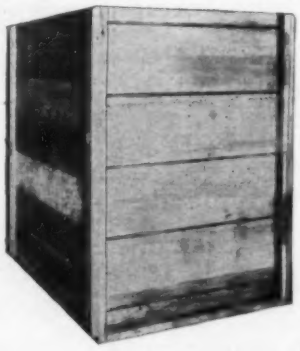
All Styles

Manufactured from
Georgia Pine
White Pine
Poplar
Cypress
and Gum

The interlocking packing case, shown in the upper left-hand corner, has advantages over other packages, especially for carrying heavy materials. In the first place lighter weight material can be used in its construction on account of the interlocking reinforcement. It is harder to pilfer or break open than other packing cases.

We are now in position to give all orders for shooks prompt attention, and will be glad to quote prices and delivery dates on any cases you might require. Our prices are very much reduced, try us.

In addition to rectangular tanks, we manufacture a complete line of round tanks equipped with round iron hoops and malleable draw lugs.



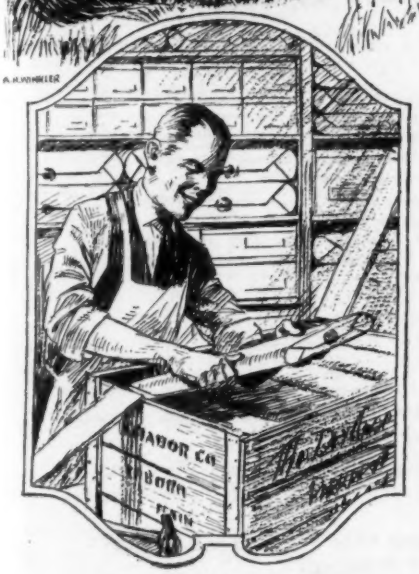
All our tanks are manufactured from heart cypress tank stock and we guarantee them to hold water.

Your inquiry solicited.

Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets

Box 1025 **Atlanta, Ga.**



—to the Journey's End

By rail or boat, by truck or wagon, through rain and storm, your goods travel a long, hard way from your mill to the retail store.

No matter how often good wood boxes are loaded and unloaded, handled with hooks, piled under heavy freight, dropped from car to platform and from truck to the ground, they guard your goods from damage.

Good wood boxes can always be opened for inspection or repacking by jobber or wholesaler. It takes only hammer and nails to make them ready for duty again. They carry your product safely to the journey's end.

Good Wood Boxes

Backed by the National Association of Box Manufacturers

GENERAL OFFICES:
1553 CONWAY BUILDING, CHICAGO

New England:
1013 SCOLLAY BLDG.
Boston, Mass.

Eastern:
433 CALVERT BLDG.
Baltimore, Md.

Southeastern:
210 WALTON BLDG.
Atlanta, Ga.

The Rule of Three
in Turbine Lubrication:

Rule I—The oil must not decompose.

Rule II—It must not form emulsions.

Rule III—It must not cause corrosion of shafts and bearings.

and how

TEXACO TURBINE OILS
measure up:

1. Texaco Turbine Oils operate over long periods without decomposing. They are pure mineral oils and great care has been taken to keep them free as possible from any materials which might oxidize or might precipitate tarry sludge when exposed to heat and pressure.
2. Texaco Turbine Oils do not cause troubles from the formation of emulsions. They are so highly refined that there are no unsaturated hydrocarbons left in them which will hold water in suspension. They free themselves readily from any water or moisture which may enter the system.
3. They will not cause corrosion of shafts and bearings as the chemically active ingredients which appear in ordinary oils are removed.

The Turbine using Texaco Turbine Oil is assured of a constant stream of clean, cooling oil by virtue of an entire freedom from clogged oil pipes. Texaco Turbine Oils are readily and rapidly filtered.

Likewise, because of negligible evaporation and the resistance to decomposition, only a very little additional oil is needed to make up the small natural losses.

In this magazine we print month after month, articles covering the problems of lubrication as applied to various dustries.

These articles are not theoretical, but based on practical operating experience.

We shall send "Lubrication" to Engineers, Executives, Buyers of Lubricants and others, who are professionally interested and who ask for it—FREE.

The following Texaco Turbine Oils are recommended:

STATIONARY TURBINES

Ring Oiler Bearings,	
Normal conditions	TEXACO REGAL OIL
Exposed to medium high temperatures	TEXACO ALCAID OIL
Exposed to very high temperatures	TEXACO ALGOL OIL
Circulating Oiling Systems, *Direct drive*	TEXACO REGAL OIL
Circulating Oiling Systems, *Reduction geared*	TEXACO ALCAID OIL

A Texaco Lubricant for Every Purpose and the best for that purpose.

Get* "Lubrication" *free

-USE THIS COUPON-

THE TEXAS COMPANY

Dept. O, 17 Battery Place, New York City

NEW YORK HOUSTON CHICAGO

Offices in Principal Cities

Kindly put me on your free mailing list for "LUBRICATION."

Name _____ *Street* _____

City _____ *State* _____

8-21

Roll Call

of White Trucks *in* the Textile Industry

THE dependable performance of White Trucks in the Textile Industry is evidenced by the rapid increase in the number of companies operating Whites. The following representative Textile Manufacturers operate a total of 305 White Trucks.

American Woolen Co.	Lawrence, Mass.
Amoskeag Manufacturing Co.	Manchester, N. H.
Andrews Mills	Woonsocket, R. I.
Aragon Mills	Aragon, Ga.
Arlington Mills	Lawrence, Mass.
Ashworth Brothers, Inc.	Fall River, Mass.
Atlanta Woolen Mills, Inc.	Atlanta, Ga.
The Augusta Factory	Augusta, Ga.
Avondale Mills	Birmingham, Ala.
Joseph Bancroft & Sons Co.	Wilmington, Del.
Barnard Manufacturing Co.	Fall River, Mass.
Baylis Sanitary Supply Co.	Chicago, Ill.
The Beckman Co.	Cleveland, Ohio
Bibb Manufacturing Co.	Macon, Ga.
Joseph Block	Philadelphia, Pa.
Brookford Mills Co.	Hickory, N. C.
Thomas E. Brown & Sons	Philadelphia, Pa.
Burson Knitting Co.	Rockford, Ill.
Cannon Manufacturing Co.	Concord, N. C.
Chadwick-Hoskins Co.	Charlotte, N. C.
Wm. B. Chant & Sons	Port Jervis, N. Y.
Cheney Brothers	South Manchester, Conn.
Cia Confianca Industrial	Rio de Janeiro, Brazil
Clark-Cutler-McDermott Co.	Franklin, Mass.
Cleveland Worsted Mills Co.	Cleveland, Ohio
Cleveland-Akron Bag Co.	Cleveland, Ohio
Collier Mills, Inc.	Barnesville, Ga.
Conestee Mills	Greenville, S. C.
Conestee Mills	Conestee, S. C.
Crompton Co.	Providence, R. I.
Dallas Manufacturing Co.	Huntsville, Ala.
Henry Doherty Silk Co.	Clifton, N. J.
Durham Hosiery Mills	Charlotte, N. C.
Durham Hosiery Mills, Inc.	Durham, N. C.
Dwight Manufacturing Co.	Birmingham, Ala.
Earlston Worsted Mills, Inc.	Greenville, R. I.
Egypt Silk Mills Corp.	New York City
Ellis Cotton Co.	Atlanta, Ga.
A. D. Ellis & Sons	Monson, Mass.
John B. Ellison & Sons	Philadelphia, Pa.
Establecimientos Americanos	Valparaiso, Chile
Eva Jane Mills	Sylacauga, Ala.
Everlastic, Inc.	Chelsea, Mass.
Faith Knitting Co.	Troy, N. Y.
Fellows-Huber Silk Co.	Stroudsburg, Pa.
Geo. M. Finn	Syracuse, N. Y.
Fonda Glove Lining Co.	Fonda, N. Y.
Georgia Cotton Mills, Inc.	Atlanta, Ga.
Georgia Duck & Cordage Mills	Scottdale, Pa.
The Goodyear Cotton Mills	Goodyear, Conn.
Grantville Hosiery Mills	Greenville, Ga.
The Groveland Mills	Groveland, Mass.
Paul Guenther, Inc.	Dover, N. J.
Haas Brothers	New York City
Halcyon Knitting Mills Co.	Bethlehem, Pa.
Halperin Mills	Brooklyn, N. Y.
Hamilton Woolen Co.	Boston, Mass.
Louis E. Harrower & Son	Amsterdam, N. Y.
Heinsheimer Bros.	New York City
Highland Cordage Co.	Hickory, N. C.
Highland Park Mfg. Co.	Rock Hill, S. C.
Samuel Hird & Sons, Inc.	Passaic, N. J.
Holeproof Hosiery Co.	New York City
Andrew Howarth & Son	Oxford, Mass.
S. Hyman Co.	New York City
Indian Bleaching, Dyeing & Printing Works	Bombay, Ind.
Interwoven Mills, Inc.	Martinsburg, W. Va.
Kayser Silk Co.	Sherburne, N. Y.
Killingly Manufacturing Co.	Killingly, Conn.
Thomas Kitson & Son, Inc.	Stroudsburg, Pa.
B. B. & R. Knight	Providence, R. I.
B. B. & R. Knight	Manchaug, Mass.
Louis Kraemer & Co.	Stony Creek, Pa.
Krout & Fite Manufacturing Co.	Philadelphia, Pa.
The Laidlaw Co., Inc.	New York City
Lancaster Mills	Clinton, Mass.
James Lees & Sons Co.	Bridgeport, Pa.
The Livingston Worsted Co.	Washington, R. I.
Locke Cotton Mills Co.	Concord, N. C.
Lois Cotton Mills	Douglasville, Ga.
McCallum Hosiery Company	Northampton, Mass.
Majestic Manufacturing Co.	Belmont, N. C.
Massachusetts Cotton Mills	Lindale, Ga.
Mazuy Mills	Newton, N. J.
Millville Manufacturing Co.	Millville, N. J.
Milstead Manufacturing Co.	Milstead, Ga.
Mollohon Manufacturing Co.	Newberry, S. C.
Monarch Mills, Inc.	Lockhart, S. C.
Monarch Mills, Inc.	Union, S. C.
Narrow Fabric Co.	Reading, Pa.
Newberry Cotton Mills	Newberry, S. C.
Newnan Cotton Mills	Newnan, Ga.
Nonotuck Silk Co.	Leeds, Mass.
Norwich Knitting Co.	Norwich, N. Y.
Pacific Mills	Columbia, S. C.
Pacific Mills	Lawrence, Mass.
Frank F. Pels & Co.	New Durham, N. J.
Frank F. Pels & Co.	New York City
Phoenix Silk Manufacturing Co.	New York City
The Phoenix Woolen Co.	Stafford Springs, Ct.
Piedmont Manufacturing Co.	Piedmont, S. C.
Piedmont Silk Co., Inc.	Chambersburg, Pa.
Richmond Hosiery Mills	Chattanooga, Tenn.
The Rich-Sampliner Co.	Cleveland, Ohio
Riverside & Dan River Mills	Danville, Va.
Rockford Mitten & Hosiery Co.	Rockford, Ill.
Rockland Webbing Co.	Rockland, Mass.
Russell Manufacturing Co.	New York City
A. H. Sands & Company	New York City
E. D. Sasson & Co.	Bombay, India
S. A. Fabrica da Sedas Helena	Rio de Janeiro
Shawmut Woolen Mills	Stoughton, Mass.
Sherman Manufacturing Co.	Sherman, Texas
A. A. Shuford Mill Co.	Hickory, N. C.
R. H. Simon Silk Co.	Easton, Pa.
Southern Manufacturing Co.	Athens, Ga.
Springfield Cotton Mills	Laurel Hill, N. C.
Stafford & Co.	Philadelphia, Pa.
Star Thread Mills	Athens, Ga.
Stark Mills	Manchester, N. H.
J. L. Stifel & Sons	Wheeling, W. Va.
Stone Cutter Mills Co.	Spindale, N. C.
Stroock Plush Co.	Newburgh, N. Y.
Summerville Cotton Mills	Summerville, Ga.
Union Manufacturing Co.	Union Point, Ga.
Utica Steam & Mohawk Valley Cotton Mills	Utica, N. Y.
Valatie Yarn Co.	Valatie, N. Y.
Virginia Cotton Mills	Swepsonville, N. C.
The Viscose Co.	Marcus Hook, Pa.
The Wallace Wilson Hosiery Co.	Philadelphia, Pa.
Louis Walther Mfg. Co.	Philadelphia, Pa.
Wamsutta Mills	New Bedford, Mass.
Wateree Mills, Inc.	Camden, S. C.
Weiner Bros.	New York City
West Point Manufacturing Co.	West Point, Ga.
White Haven Silk Co.	White Haven, Pa.
White-Williamson Co.	Burlington, N. C.
Jas. N. Williamson & Co.	Burlington, N. C.
Winnsboro Mills, Inc.	Winnsboro, S. C.
Winona Cotton Mill	Winona, Miss.

There are now in actual service 4,707 White fleets, comprising 47,351 trucks, exclusive of single truck installations.

THE WHITE COMPANY, *Cleveland*

White Trucks

Hitting the Bulls Eye

Genuine oak-tanned leather belting cut from backbone center stock, Cocheco rings the bell for lasting satisfaction. Quality and length of service are the things on which the popularity of this efficient power transmission medium have been built, and long experience (79 years) in manufacturing belting has taught us that these can only be obtained from first quality stock by scientifically planned, carefully supervised processes.

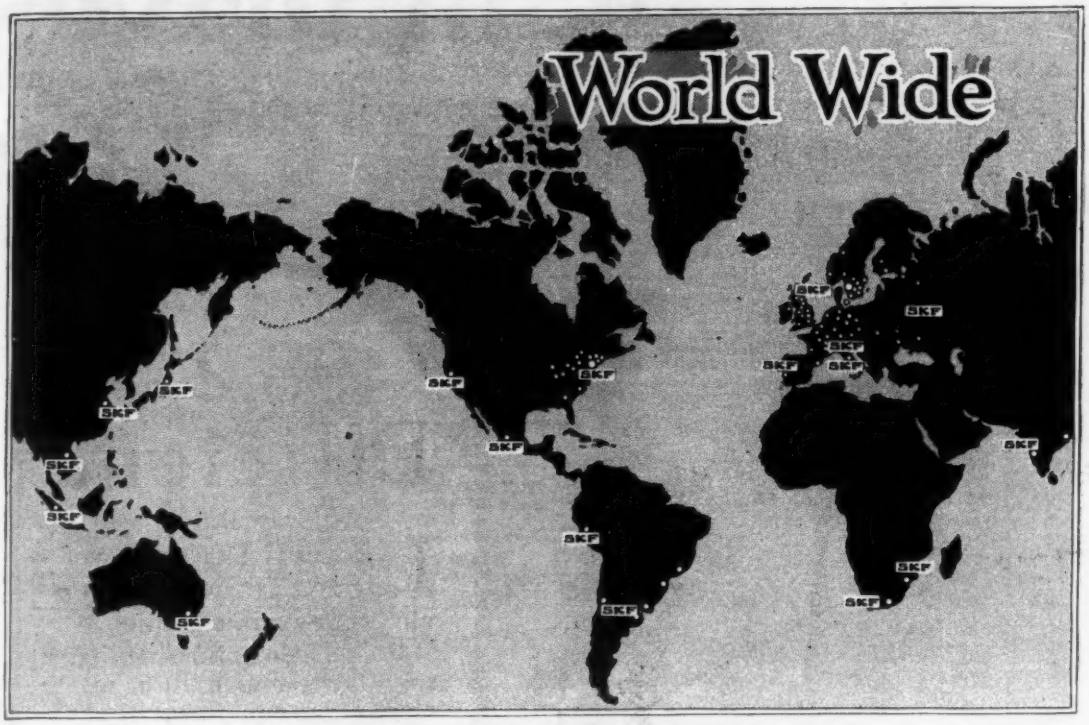
Our belting booklets will tell you all about Cocheco Belting and how it is made, and will give you in addition some interesting general information on belting and its use. They will help you understand why Cocheco Belting has been hitting the Bulls Eye with discriminating buyers for so many years. Let us send them.

I. B. Williams & Sons

Dover, New Hampshire

BOSTON, MASS., 157 Summer St.
NEW YORK, N. Y., 71-73 Murray St.
CHICAGO, ILL., 14-16 N. Franklin St.

The technical knowledge that comes to you from SKF engineers is



as it is the sum of the data gathered by SKF organizations in all industrial countries.

This fund of engineering information we bring to the fabrication of all products bearing the mark SKF and the operation of those industries which we are requested to supervise. In order that complete reliance may be placed in the endorsement expressed by the mark SKF it is necessary not alone that we control and supervise each step in the manufacture of a product but also its final installation.

Because every effort is made to assure the most satisfactory use of products marked SKF we welcome requests for information concerning their proper application and maintenance.

Textile manufacturers should feel that this technical knowledge is always available. You are urged to use it freely without any sense of obligation.

SKF Industries, Inc.
165 Broadway, New York City

Supervising at the request of the stockholders.
- The Hess-Bright Manufacturing Co.
- The Skayef Ball Bearing Co.
- Atlas Ball Co.
- Hubbard Machine Co.
- SKF Research Laboratory

620

LINK-BELT
Silent Chain Drives

98.2% Efficient

(on actual test)

LINK-BELT Silent Chain Drives can be applied to almost any mill condition.

For driving lineshafting, spinning frames, knitting machines and equipment of every kind, in every industry, they are rapidly superseding flat belts and gearing. Link-Belt Silent Chain is Flexible as a Belt—Positive as a Gear—More efficient than either.

Let one of our experienced power transmission engineers tell you what Link-Belt Silent Chain Drives can accomplish in your plant.

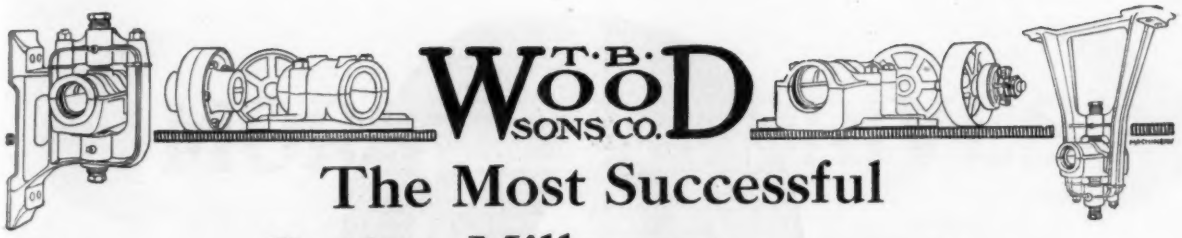
Send for 128-page pricelist data book No. 125.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

New York . . . . . 299 Broadway
Boston 9 . . . . . 49 Federal St.
Pittsburgh . . . . . 1501 Park Bldg.
St. Louis . . Central Nat'l Bank Bldg.
Buffalo . . . . . 547 Ellicott Square
Wilkes-Barre . . . . 2d Nat'l Bank Bldg.
Huntington, W. Va. Robson-Prichard Bldg.
Cleveland . . . . . 429 Kirby Bldg.
Detroit . . . . . 4210 Woodward Ave.
Minneapolis . . . . 418 S. Third St.
Kansas City, Mo. . 306 Elmhurst Bldg.
Seattle . . . . . 820 First Ave., S.
Portland, Ore. . . First and Stark Sts.
San Francisco . . . 168 Second St.
Los Angeles . . . 163 N. Los Angeles St.
Atlanta 707 Citizens and Southern Bk. Bldg.
Toronto, Can. Canadian Link-Belt Co., Ltd.
Montreal, Can. Canadian Link-Belt Co., Ltd.
Denver Lindrooth, Shubart & Co., Boston Bldg.
Louisville, Ky., Frederick Wehle, Starks Bldg.
New Orleans, C. O. Hinz, 504 Carondelet Bldg.
Birmingham, Ala.,
S. L. Morrow, 720 Brown-Marx Bldg.
Charlotte, N. C., J. S. Cothran, Com. Bk. Bldg.

675



T·B·WOOD SONS CO.

The Most Successful Cotton Mills are those

best equipped to "carry on" in their particular line of endeavor.

And you will usually find them equipped with the

T·B·WOOD SONS CO.

Line of Power Transmission Machinery

SHAFTING
COUPLINGS
SET COLLARS
:PULLEYS:
:HANGERS:
FRICTION:
:CLUTCHES

BASE PLATES
FLOOR STANDS
PILLOW BLOCKS
WALL BRACKETS
ROPE SHEAVES
BELT.....
TIGHTENERS

T. B. WOOD'S SONS CO. CHAMBERSBURG, PENNA.

POWER TRANSMITTING MACHINERY

Strom Bearings Carry the Increased Load Caused By Changing From Belt to Chain Drive

When changing a spinning frame from belt to chain drive, the load on the cylinder shaft is increased in approximately the same ratio as the diameters of pulley and sprocket. If the sprocket is half the diameter of the old pulley, the load on the bearings will be twice as great.

This increase in load frequently causes bearing trouble. This trouble can be avoided by replacing the old inboard and outboard bearings with Strom ball bearing boxes at the time the new drive is installed.

Strom ball bearings not only eliminate all bearing troubles, but save fully 95% of the oil required for plain bearings, reduce frequency of oiling to once in three or four months, are cleaner, save power and reduce maintenance costs.

Bearings with boxes to fit different makes of frames can be obtained from the Aldrich Machine Works, Greenwood, S. C.

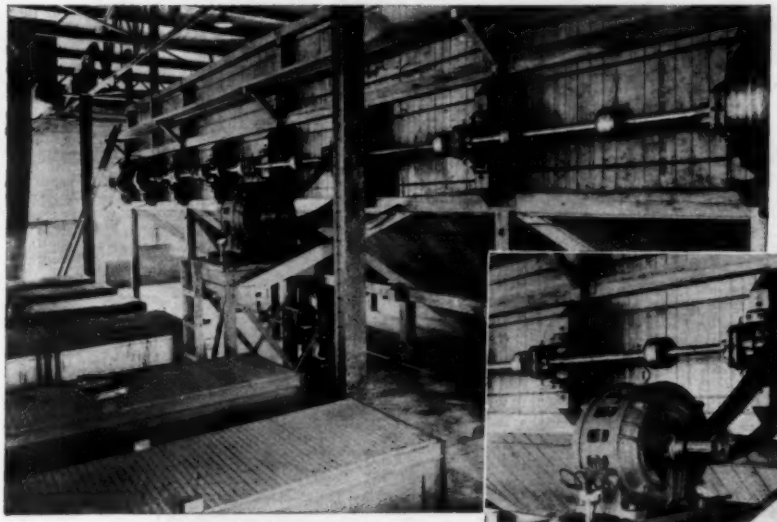
U. S. Ball Bearing Mfg. Co.
(Conrad Patent Licensee)
4544 Palmer St. Chicago, Ill.

Strom BEARINGS

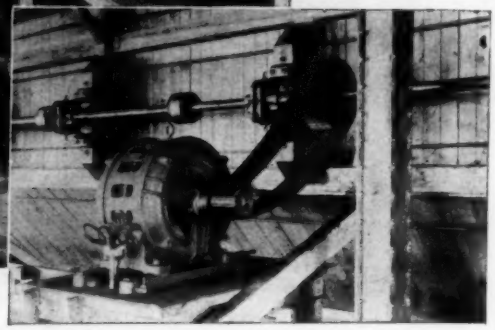
MORSE SILENT CHAIN DRIVES

THE MORSE "ROCKER JOINT"

ELIMINATE TRANSMISSION WASTE



50 H.P. Morse Silent Chain driving Grinding Room lineshaft.



If these pictures suggest a possible application of Morse Chain Drives to troublesome or expensive belt transmissions in your factory consult our sales engineers.

Union Seed & Fertilizer Co.
Memphis Plant American Cotton Oil Co.
Equipped Thruout with Morse Silent Chain Drive.

Heavy Duty **Heavy Service**

The Drive that will not heat, is the Rocker Joint. Oil Baths Not Required.

Morse drives have all the advantages and none of the drawbacks common to both gear and belt drives. Maximum flexibility, no slip and the elimination of the oil bath are contributory to their high efficiency of 98.6%. There is only one steel belt that since the beginning of its use has made good and held itself supreme through years of hard service, and that one is "MORSE."

Bring your POWER Transmission Problems to MORSE Engineers. They are men of wide experience. Let them help you plan your drives.

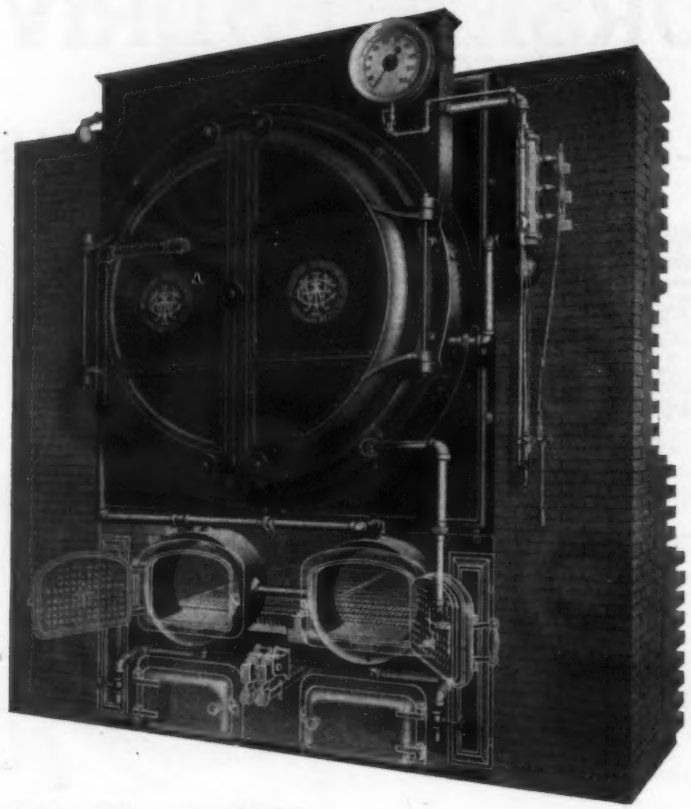
MORSE CHAIN CO., ITHACA, N. Y.

LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD

MORSE ENGINEERING SERVICE **Address Nearest Office** **ASSISTANCE WITHOUT OBLIGATION**

BALTIMORE.....1402 Lexington Bldg.
BOSTON.....141 Milk St.
CHICAGO.....Merchants L. & T. Building
CLEVELAND.....Engineers Building
DETROIT.....1361 Abbot St.
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
NEW YORK.....50 Church St.
PHILADELPHIA, PA.....803 Harrison Bldg.
PITTSBURGH.....Westinghouse Bldg.
SAN FRANCISCO.....Monadnock Bldg.
CANADA.....Jones & Glassco, Reg'd
Montreal: St. Nicholas Bldg.
Toronto: Bank of Hamilton Bldg.
ATLANTA, GA.....Earl F. Scott & Co., 702 Candler Bldg.
KANSAS CITY, MO.....Morse Eng. Co., Finance Bldg.
MINNEAPOLIS, MINN., Strong-Scott Mfg. Co., 413 Third St. S.
ST. LOUIS, MO.....Morse Engineering Co., Chemical Bldg.

FOR LASTING DOOR ARCHES
In Your Return Tubular Boilers



Build them With
SMITH DOOR PROTECTORS

Patented

Scientifically designed for the greatest of strength and durability in service. Made of steel plate the same as is used in the boiler.

Circular in shape with a hollow semi-oval cross-section to provide for continuous water circulation from the boiler. This keeps the surrounding brick work cool and prevents its rapid deterioration. The intense furnace heat is held back from the doors in firing which makes it more comfortable to the men who consequently can give better attention to the fires.

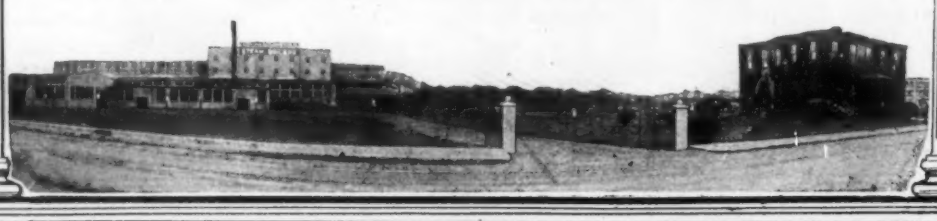
Not expensive to install. Once in place they will save many times their cost by the ensuing reduction in door arch repair expense and the elimination of costly shutdowns to renew fallen door arches.

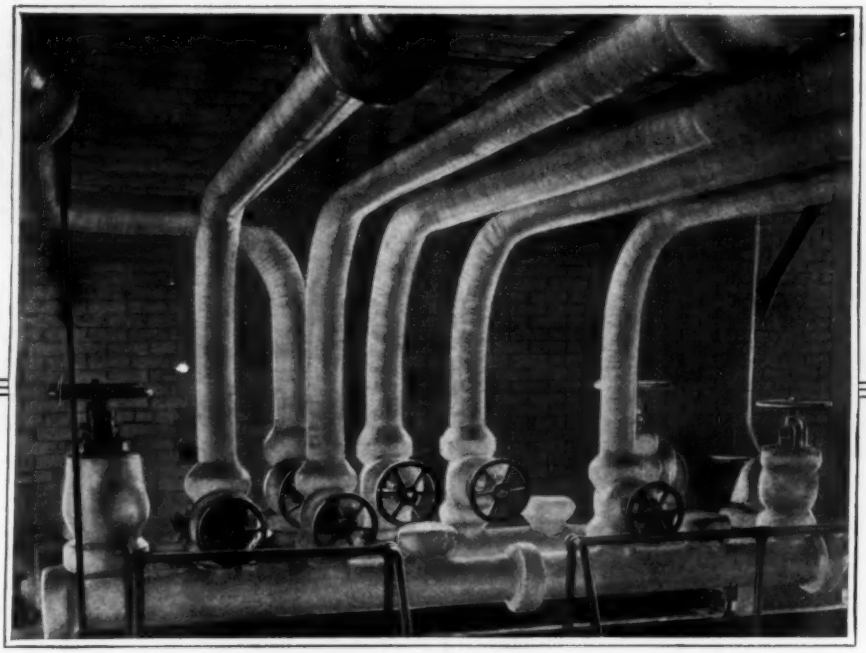
Designed for Horizontal Return Tubular and hand fired Water Tube Boilers. Ask us to send you full particulars, regarding their application to other plants.

Write us for bound Bulletins describing our line of Return Tubular Boilers, Water Tube Boilers, Manning Type Boilers, Brady Scotch Boilers, Macdonald Shaking Grates and Smith Door Protectors.

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative: Isaac Hardeman, Charlotte, N. C.
Boston New York Philadelphia San Francisco





A properly designed system installed with

CRANE
Piping Equipment

insures safety, reliability, and a minimum maintenance cost.

We are manufacturers of about 20,000 articles, including valves, pipe fittings and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes and are distributors of pipe, heating and plumbing materials.

SALES OFFICES, WAREHOUSES AND SHOWROOMS:

BOSTON, SPRINGFIELD, HARTFORD, BRIDGEPORT, ROCHESTER, NEW YORK, HARLEM, ALBANY, BROOKLYN, PHILADELPHIA, READING, ATLANTIC CITY, NEWARK, CAMDEN, BALTIMORE, WASHINGTON, SYRACUSE, BUFFALO, SAVANNAH, ATLANTA, KNOXVILLE, BIRMINGHAM, MEMPHIS, LITTLE ROCK, MUSKOGEE, TULSA, OKLAHOMA CITY, WICHITA, ST. LOUIS, KANSAS CITY, TERRE HAUTE, CINCINNATI

FOUNDED BY R. T. CRANE, 1855

CRANE CO.
836 S. MICHIGAN AVE.
CHICAGO

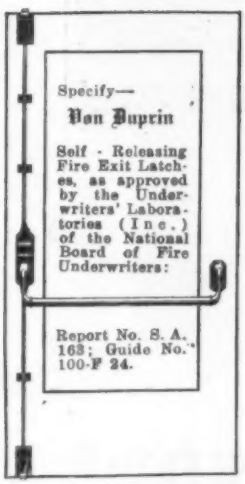
WORKS: CHICAGO AND BRIDGEPORT

INDIANAPOLIS, DETROIT, CHICAGO, ROCKFORD, OSHKOSH, GRAND RAPIDS, DAVENPORT, DES MOINES, OMAHA, SIOUX CITY, MANKATO, ST. PAUL, MINNEAPOLIS, WINONA, DULUTH, FARGO, WATERTOWN, ABERDEEN, GREAT FALLS, BILLINGS, SPOKANE, SEATTLE, TACOMA, PORTLAND, POCATELLO, SALT LAKE CITY, OGDEN, RENO, SACRAMENTO, OAKLAND, SAN FRANCISCO, LOS ANGELES

CRANE LIMITED — MONTREAL, TORONTO, VANCOUVER, WINNIPEG, CALGARY, REGINA, HALIFAX, OTTAWA, QUEBEC, LONDON, ENG.

Von Duprin

Self-Releasing Fire Exit Latches


Specify—
Von Duprin
Self - Releasing Fire Exit Latches, as approved by the Underwriters' Laboratories (Inc.) of the National Board of Fire Underwriters:
Report No. S. A. 163; Guide No. 100-F 24.

RESPONSIBILITY !

The man whose judgment is responsible—directly or indirectly—for the safe-keeping of human lives, cannot afford to gamble with fire-panic.

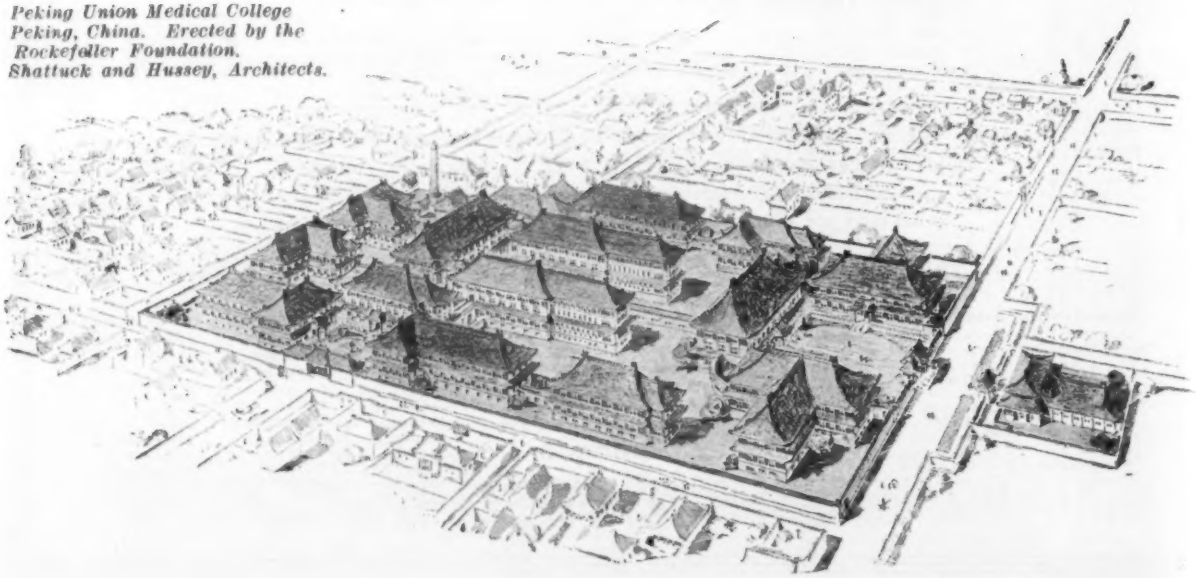
By equipping all exit doors with Von Duprin Self-Releasing Fire Exit Latches, safe exit is made certain, once the inmates reach the doors. The mere touch of hand or body on the cross bar immediately releases the door, even though it may be locked from the outside.

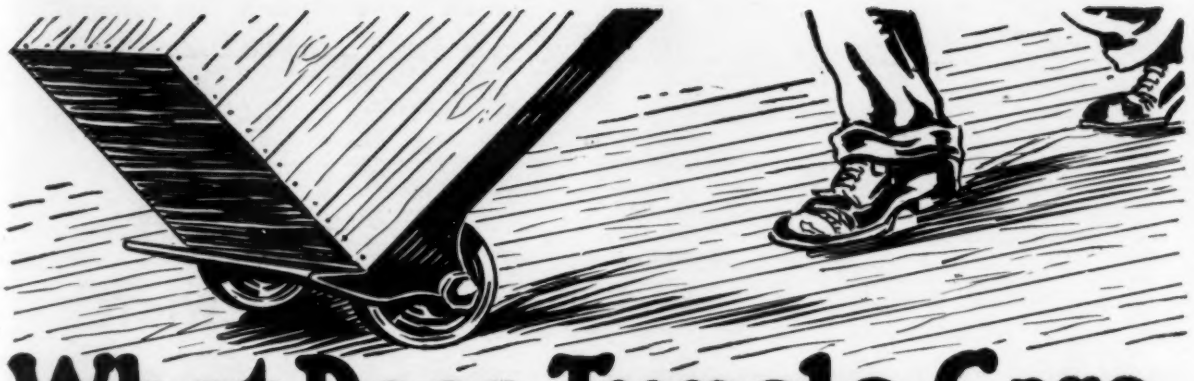
No Von Duprin latch, anywhere, has ever failed to operate in an emergency.

Let us send you Catalog 12-T, and the new booklet, "Saving Lives."

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Peking Union Medical College Peking, China. Erected by the Rockefeller Foundation. Shattuck and Hussey, Architects.





What Does Tupelo Care-

for the hard knocks which heavy loads and heavy shoes impose on a "Tupelo" floor?

"'Nary a care!"

For "Heavy Going"

"a-wheel" or "a-foot," Tupelo floors in Textile Mills, Factories and Warehouses seem to actually grow solider and smoother as they grow older. Nature has supplied

TUPELO, the "Hard-Wear" Lumber

with a closely "knitted" or involved grain, which accounts for its non-slivering, non-splintering and long-wear characteristics.

For *all* the Tupelo facts—please write—*and you can't lay a floor quite* right *until you do.*

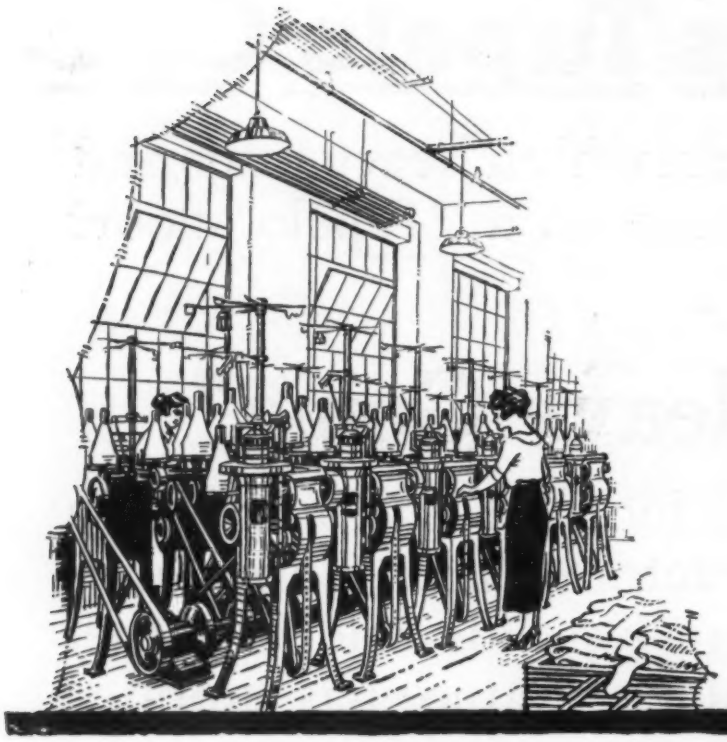
SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

805 Poydras Building, New Orleans, La., or 805 Graham Building, Jacksonville, Florida.

OJACO

MILL·WHITE

Remedies poorly-lighted conditions in the Hosiery Mill — minimizes defective production.



HOSIERY sale! Factory seconds at reduced prices! In retail stores from coast to coast are these signs that represent hosiery manufacturers' losses —goods that fail to come up to the required standard because of a defect that mars them.

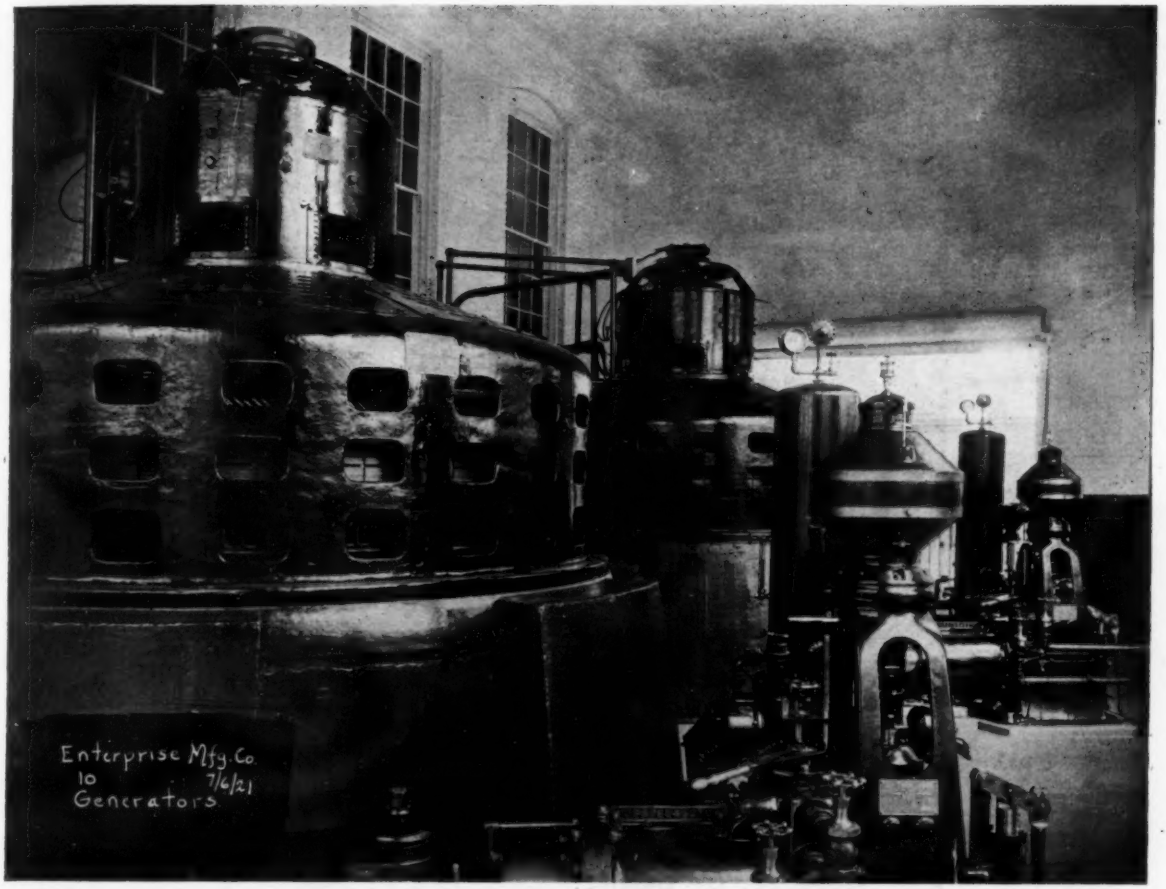
Strike at the source of this evil. Good light will help. Nature's light, put to work in the mill on double duty. Every clear day in the year a better working day because OJACO Mill White on ceilings and walls is making the sun work.

No glare! A softly diffused glow that helps the eyes and guides the hands to perfect work. A clean, bright, wholesome working place where workers' morale is unconsciously and inevitably kept higher—with attendant increase and improvement in production.

Write, wire or telephone for an OJACO expert. Listen to him for a few minutes. He'll show you one way to improve your output.

OLIVER JOHNSON & CO., Inc.
Paint Makers
Providence, R. I.

DISTRIBUTORS: Cowles & Bleckley, Atlanta, Ga.; Charlotte Supply Co., Charlotte, N. C.; Lewis E. Tracy Co., Boston, Mass.; F. P. Van Hosen Co., Rochester, N. Y.; M. F. Bragdon Paint Co., Portland, Me.; Dwelle-Kaiser Co., Buffalo, N. Y.; American Hard Wall Plaster Co., Utica, N. Y., B. A. Cook Co., Fitchburg, Mass.; J. B. Farnum Co., Woonsocket, R. I.; Alexander Grant's Sons Co., Syracuse, N. Y.; Wm. F. Harticon, Fall River, Mass.



WATERWHEEL INSTALLATION FOR THE ENTERPRISE MANUFACTURING CO., AUGUSTA, GA. J. E. SIRRINE & CO., ENGINEERS, GREENVILLE, S. C.

THIS WATERWHEEL INSTALLATION WAS COMPLETED UNDER DIFFICULT ALTERATION CONDITIONS BY ONE OF OUR EXPERIENCED ORGANIZATIONS TO THE ENTIRE SATISFACTION OF OUR CLIENT.

THE FOUNDATION COMPANY

ATLANTA

NEW YORK
NEW ORLEANS
CHICAGO
PITTSBURGH
DETROIT
SAN FRANCISCO
MONTREAL, CANADA
PARIS, FRANCE
LIMA, PERU
HAVANA, CUBA
TAMPICO, MEXICO

BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES

EBG

Liquid Chlorine

EBG

Confidence

The keynote of successful effort is confidence. It is vital to the economic and financial structure of the country. The whole fabric of our industrial and political life rests upon it.

So it is with our business, old customers stick and new ones come to us, because, by actual experience or our reputation for faithful service, they have implicit confidence in our ability and desire to take care of their Liquid Chlorine requirements—whether it is for a cylinder or a tank car.

Get into the E. B. G. fold and put an end to your Liquid Chlorine worries for all time!

Booths 408 and 410 at the Seventh National Exposition of Chemical Industries

EBG

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Plant: NIAGARA FALLS, N.Y

Main office 18 East 41st Street New York *Chicago office* 11 So. La Salle St.

EBG

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Member Associated Business Papers, Inc.

Member Audit Bureau of Circulation.

Volume 85 **No. 11**

CONTENTS

EDITORIAL—

The Outlook at Washington 805

Some Interesting Figures 806

Expositions 806

GENERAL AND TECHNICAL—

The Importance of Leadership 807

Carders Discussion at Columbia 809

Popular Textile Chemistry 817

Slashing Cotton Warps 819

When Callaway Received His Cane 822

What the Southern Mills are Doing 823

The New England Mill Situation 825

Cotton Comment 826

The Design and Manufacture of Fustians 828

Bureau Work Duplication at Washington 831

Textile Products Show 832

Cheap Mercerized Colored Fabrics 834

Notes About Men You Know 838

HOW OTHER MEN MANAGE—

Relation of the Treadle to the Cam 841

Twist on the Fly Frame 844

Increasing the Breaking Strength 844

No. 1 Versus No. 2 Flange Rings 847

Two Versus Three Processes of Picking 849

Card Clothing Wire 849

An Interesting Power Test 851

Character 851

Effect of Changes in Length of Stock 852

An Appeal for More Cooperation 853

A Price Chart 855

Notes About Men You Know 856

KNITTING SECTION—

The Knit Goods Market 859

Branded Versus Unbranded Goods 862

National Knitters Executive Board Meets 863

The Knit Goods Industry 865

Among the Knitting Mills 867

Some American Knitting Corporations 868

The Yarn Market 869

A Duration Time Study Watch 871

Seventh National Chemical Show 871

Engineers' Test Proves Hyatt Equipped Spinning Frames Save 10.9% Power

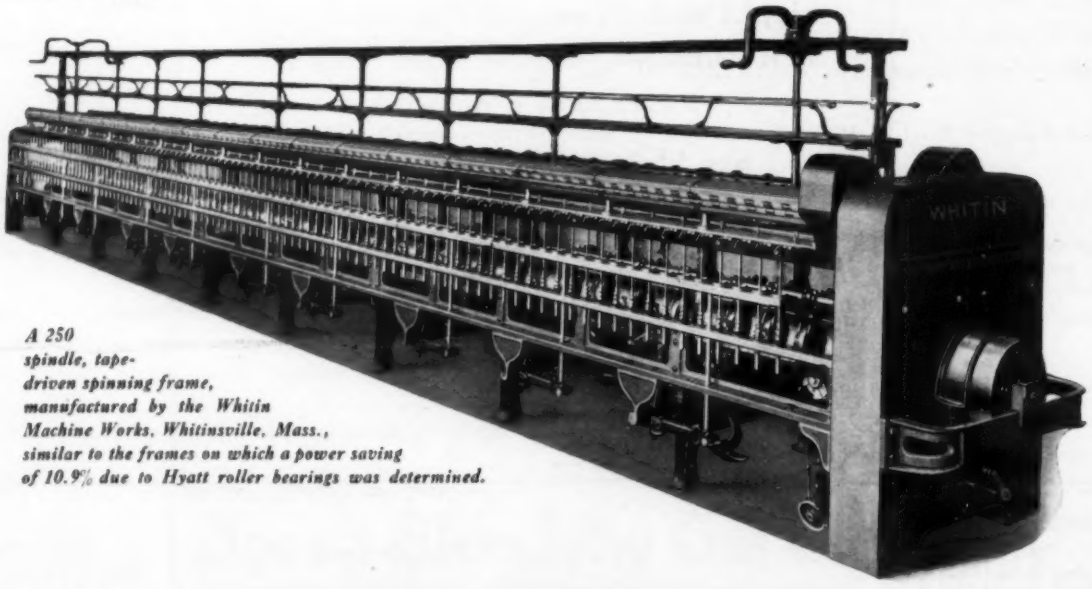
A recent comparative test between four plain bearing Whitin spinning frames and the same frames equipped with Hyatt roller bearings proved that Hyatt equipped frames save 10.9% in power, or about ½ H.P. per frame.

This test was conducted under actual operating conditions in a large mill by engineers of the Hyatt Roller Bearing Company and was witnessed by a representative of the Whitin Machine Works. The average results of a large number of readings show a 10.9% power saving in favor of the Hyatt equipped frames.

This power saving of 10.9% or ½ H.P. per frame indicates a yearly saving of $20.00 per frame, figuring power at the low cost of $40.00 per H.P.

With a power saving of $20.00 per frame per year and a real reduction in lubrication costs secured by Hyatt bearings, can you longer afford to operate plain bearing frames?

Specify that your new frames be Hyatt equipped and have them applied to your present frames. The extra cost is very low. Complete information on request.



A 250 spindle, tape-driven spinning frame, manufactured by the Whitin Machine Works, Whitinsville, Mass., similar to the frames on which a power saving of 10.9% due to Hyatt roller bearings was determined.

Hyatt Roller Bearing Company, New York, N. Y.

With the Publishers—

Arthur L. Burton

The Importance of Leadership

Addison says, "Knowledge is that which, next to virtue, truly and essentially raises one man above another." To this statement Samuel Johnson adds, "Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it." However, the first step to self-knowledge is self-distrust. Nor can we attain to any kind of knowledge except by a like process.

The authority to issue an order assumes a knowledge of how the work should be done and involves the responsibility to see that it is properly executed. An adherence to this principle will eliminate that class of managers, superintendents and department heads who seek to shift the responsibility for their errors upon the shoulders of their subordinates. This gradual but natural elimination allows authority to slowly but surely gravitate to those who have the knowledge and who also have the ability to use it.

These overseers and superintendents represent the technical side of the cotton manufacturing industry. They are the men who possess the "know how" in the factory. When the raw stock varies or the machines in their care fail to do the work required, these men are competent to diagnose the difficulty and effect a cure. But these men have another variable factor with which to contend, and one far more difficult to regulate than troubles of a vegetable or mechanical origin, this is the mass psychology of the operatives as opposed to the personal viewpoint of the owner or the owner's representative. They are the point of contact between the employed on the one hand and the employer on the other. It is their collective duty to provide the necessary lubricant to prevent undue friction at this point of contact.

Please note the use of the word "collective" in the previous sentence. This implies team work. Team work means the complete cooperation of the superintendent and his department heads, and the gist of cooperation is to have a common cause and then to work the other fellow's way when he won't work yours. The best cooperator is the man who can get the most pleasure out of doing things the other fellow's way.

For many years men have been perfecting machinery for the mill and during the last few years much time and effort has been devoted to the problem of studying, perfecting and educating the human machine. It costs a great deal of money to hire green operatives, train them to varying degrees of efficiency, and then to discharge them. This fact has been recognized by many managers and numerous efforts have been made to produce contentment. A large percentage of these efforts have been along educational lines, direct and indirect, the intention being to open the way and point out to the operatives many opportunities hitherto unavailable or unseen. The application of these efforts has tended to improve the morale of the operative body, has increased the physical efficiency of individual workers, has improved the general standard of living, and in some instances has created an increased interest in the home and its environs, including the community and the mill. But there is something still lacking. These efforts have neither created nor induced contentment. There remains some lost motion in the organization which allows the entrance of grit between the smooth rubbing surfaces of the "point of contact."

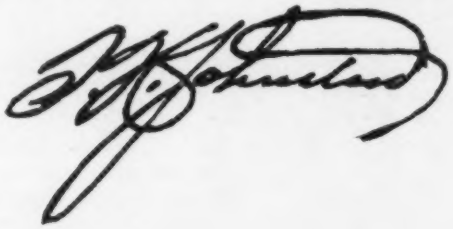
On another page of this number is a discussion of this question of contented versus discontented workers by Arthur L. Burton, writing under the caption, "The Importance of Leadership." Mr. Burton has had an opportunity to study this subject from several angles, inasmuch as he entered the mill game as an operative at the age of ten years, has been overseer of spinning for such mills as the Lawton Mills Corporation, Plainfield, Connecticut, and the Butler Mills, New Bedford, Massachusetts, latter becoming night superintendent for the latter plant. He has been connected with some other mills, has erected cotton machinery and is now in the specialty business building waste saving and labor saving devices for cotton mills. He is well known to regular readers of COTTON as the author of the series of articles on the "Practical Technic of Mule Spinning" which appeared a few months ago.

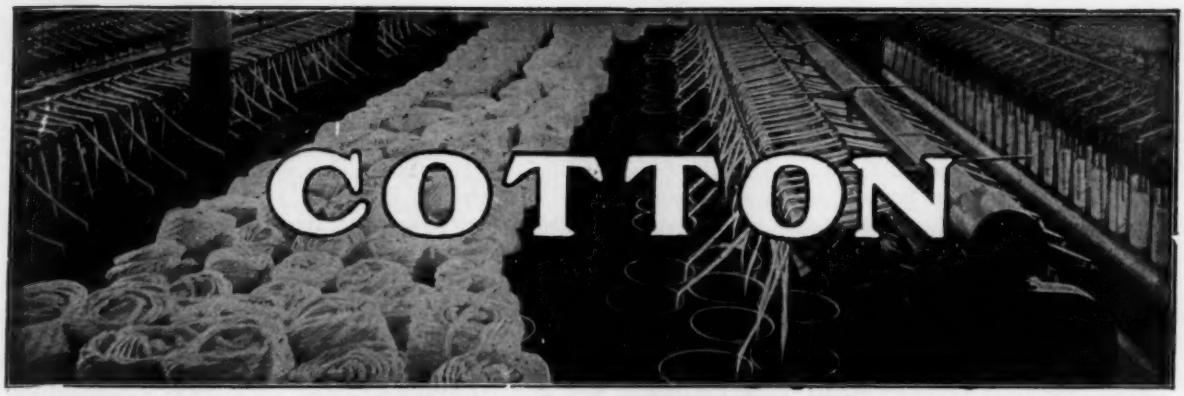
The discussion Mr. Burton has opened in this number is on a subject of particular interest to practical mill men, as well as to that class of specialists in the industrial field known as service superintendents. It is also of especial interest to those mill owners who have invested much money and effort in work of the character outlined and some of whom feel that much of the endeavor has been fruitless. Has it? Each man should answer this question for his own mill or mills. He should study and analyze the situation carefully. If unsatisfactory, he should compare results obtained with those of other mills and when mills are found where the compensation seems to warrant the investment, make a careful comparative study of the methods used. He may find the knowledge of value.

AMONG COTTON'S READERS

T. H. JOHNSTON
President and General Manager
Knoxville, (Tenn.) Knitting Mills Co.
Past President, National Association of Hosiery and Underwear Manufacturers

"I consider COTTON a very valuable publication for the textile trade. For information and for news that is helpful, I consider it the biggest value for a dollar that I have ever seen."





September, Nineteen-Twenty-One

The Outlook at Washington.

As the year rounds into the Fall, the business and industry of the nation turns most anxiously to Washington to learn what progress has been made there toward the governmental solution of our great economic problems. For the autumn months, with the harvesting of the crops, should bring with them a vigorous resumption of business and start anew the whirr of busy factories.

The new administration at Washington has now had six months in which to put its policies into law. But it has been a difficult task. Never before in the history of American legislation, has there been such economic chaos in the world. To fit our national industrial machinery into this disordered mass, is a super-task not easy to be solved. For every time it seems as though the wheels of our commerce and industry had been put into operation again, some new break occurs in the delicately adjusted cogs of international economics and we have to wait for new repairs.

Just now official Washington is struggling with a long list of problems which it had hoped to answer early in the spring. Neither the tax revision nor the rewriting of the tariff law has been completed. These are complicated matters. They involve an infinite adjustment and the consideration of a thousand factors that hamper the most earnest legislator. It is still too early to predict when either the tax bill or the tariff bill will become a law. Not only are they dependent on each other but they are dependent on a score of contingences that are difficult to forsee. The tariff bill, for instance, must be adjusted to foreign labor prices and foreign exchange rates that are fluctuating daily. A tariff of customs duties can not fluctuate. Nor can it be made to fit itself automatically to such changes. It must be a fixed scale.

Nor is the internal tax problem easy to solve. The recommendations which the Treasury Department made for changes in the income taxes made vital alterations in the higher tax schedules. To a considerable extent, they were based on a revision downward of the taxes on larger fortunes. The Treasury Department insisted that this was necessary to stop conversion of large fortunes into tax-exempt securities and to keep this money in productive fields. But income tax revision downward is just as unpopular as is tariff revision upward. Treasury exigencies and the crying need for heavier protection and greater customs returns may make both necessary. But necessity does not lessen their unpopularity. As a result, the political party which does either must face a difficult campaign in the next election. This fact has been largely responsible for the slowness with which the Republican leaders, who are running the Congress, have been committing their party to final action.

But even the tax and tariff problems are only a starter in the way of administration difficulties. Despite the progress that has been made, the railroads of the country are still far from economic prosperity. Upon their prosperity depends a host of other industries. Transportation difficulties are a check to normal commerce. A financial crippling of the railroads, largely a result of wages paid to McAdoo's "boys," has made it impossible to keep the railroads in trim for the resumption of industrial activity. The government realizes this, and the government has endeavored to find some way by which the railroads can be returned to what President Harding likes to call "normalcy." It was thought that a solution had been found by entrusting this task of financial relief to the revivified War Finance Corporation. Some progress has been made here, but the railroads are still limping and will continue to do so until expenses are made to fit revenues.

Our foreign commerce is still on the downward path. American exports continue to decline at a rate that threatens paralysis where it has not already broken down domestic production. The export figures compiled at Washington have shown no signs of a resumption of foreign demand. In the early stages of the administration, there were intimations that means would be found to organize European credits and restore the demands of Europe for American wares. But the value of the American dollar in foreign exchange has become too high for normal purchases by Europe. Nor is Europe in a position to buy freely anywhere. The treaty of Versailles seems as far as ever from putting Europe on its feet. The instability of European governments, the continual threat of war, the bickerings of cabinets, and the unchecked output of depreciated currencies have forbidden a healthy resumption of European industry. Until the factories of Europe can be put to work, the workers of Europe can not buy in the markets of the world nor can they pay for what they buy.

The apparent collapse of the entire economic structure of Russia resulted in offers of aid from the United States as well as from European countries. Of itself this means little in the way of putting Russia into the markets of the

world. The money which will be spent in feeding the starving millions, will have to come out of the Western nations and will have but slight effect on business resumption. If a stable government can be rebuilt on the ruins of Russia, and if that government can obtain the political and economic recognition of Western Europe and of the United States, the 180,000,000 of Russian peoples will finally become again a part of the great machine of international industry and commerce. That will be an important event in the restoration of the world. But that event is far off. Nothing that has come from Russia indicates that so difficult a process can be worked out before 1923, if then.

There is another phase in our foreign commerce that plays a vital part in domestic business. That is the restoration of the American Merchant Marine. The new Shipping Board has found its hands full with the difficult problems of making the war-built ships the basis for a great American shipping power upon the ocean. The terrific deficits that have already accrued and the costs that are still inevitable have done much to dampen the ardor of those who have fought through decades for a restoration of the American flag in merchant shipping. On the other hand, it has been pointed out again and again that when international commerce resumes a normal aggregate, American ships must be ready to do their bit or our home industrial machine will find itself again at the mercy of foreign shipping.

These and many other factors, in their turn, have a vital bearing on the most important factor of all in the restoration of prosperity. That factor is our own home market. If the American farmer and the American workman can put into that market a normal purchasing power, it will exceed any possible export purchases. But this purchasing power of our farmers and our workers is partly conditioned on international normality of commerce. There can be no great prosperity in the United States, if the rest of the world stands idle threatened by famine and disease.

Some Interesting Figures.

The story of the cotton goods industry of the United States, as told by the documentary statistics of the Census Bureau, gives an excellent illustration of the abnormality of the price inflation during the last five years. In 1914, 1,179 plants produced $676,569,000 worth of cotton goods. In 1919, for which the figures have just been collected, 1,290 establishments recorded an output of $2,125,447,000. Of the total output, 70 per cent is represented by woven goods totaling 6,232,842,000 square yards at a value of $1,487,723,000. In 1914 the yardage was more—6,813,541,000 yards—but the value was only $489,985,000. The value of the yarns produced for sale aggregated 625,071,000 pounds in 1919 worth $460,479,000 against 497,987,000 pounds in 1914 and a value of $127,364,000.

The 1,290 establishments which make up this cotton goods industry cover 30 states. Seventeen of these states have ten or more establishments each and reported, in the aggregate, 90 per cent of the total value of the products of the industry.

Massachusetts leads by a large margin with 191 establishments and an output of $596,687,000. North Carolina is second with 311 plants and a production of $318,368,000. South Carolina is third with 145 establishments and an output of $228,440,000. Georgia is fourth with 132 plants and an output of $192,188,000. Rhode Island is fifth with 74 factories and a production of $155,488,000. The only other state in the $100,000,000 class is Connecticut with 47 plants and a production of $101,551,000. The other important states, in their order, are: New Hampshire, 16 plants with $85,986,000; Alabama, 58 plants with $79,643,000; Pennsylvania, 119 plants with $66,539,000; New Jersey, 33 plants with $58,711,000; Maine, 14 plants with $56,564,000; New York, 37 plants with $49,076,000; Virginia, 10 plants with $32,535,000; Tennessee, 16 plants with $22,461,000; Maryland, 14 plants with $18,455,000; Texas, 15 plants with $13,920,000; and Mississippi, 15 plants with $8,067,000.

The Massachusetts share of the industry is thus considerably more than ¼—28.1 per cent. Three states—Massachusetts and the Carolinas—control 53.8 per cent, while six states, Massachusetts, North Carolina, South Carolina, Georgia, Rhode Island and Connecticut, control nearly three-fourths or 74.9 per cent of the total value of the products of this country.

From the standpoint of production these figures mean very little. They show an increase in yarn poundage and a decrease in cloth yardage in 1919 as compared with 1914. When the figures for 1920 and 1921 are compiled, the swing of the price pendulum in the other direction will be very evident, while similar figures for 1922 will again curve upward, caused by the reduced cotton crop this year and the increase in wholesale buying that will be necessary to replenish empty shelves.

The industry is once more on the upgrade.

Expositions.

Expositions pay. The exhibitor is benefited; the visitor is benefited. The former is provided with a potential market, which is part embryonic, part real. It at least places his product before a number of those with whom he is most desirous of getting in touch—his prospects—and he is given a chance to display his actual wares in a short period of time to many more prospects than would be possible in any other way.

The "visitor" to a show or an exposition is generally a representative of the particular field or industry covered by the event, and he profits by being able to see in a comparatively short time practically all the latest developments in his especial field, whether it be machinery, chemicals, dry goods, advertising, drugs, boots and shoes, textiles or some other of the many articles whose producers are utilizing the exposition as a medium for presenting them to their markets.

Furthermore, there is always some benefit derived by both sides from the opportunity for discussion and interchange of ideas and suggestions, and the talking over of mutual problems and difficulties, which accompanies an exposition.

And expositions are continually being improved, as wise men are always ready to let their actions be guided by experience, to make stepping stones to greater achievements of tomorrow from the actions of yesterday.

Perhaps the example of this increasing value that is

(*Continued on page* 818.)

The Importance of Leadership

BY ARTHUR L. BURTON.

Will textile labor ever be contented again? Rather a peculiar question, spoken literally. The inference is that textile labor is not a contented body of workers. The answer might be that they are not alone in their discontentment, that other workers, in other trades outside of textiles, are in the same boat. That is true. There is no use in gainsaying or denying the fact that the boat is being rocked and that many of the passengers are being made sick.

It has been my experience on many trips in a small but seaworthy fishing boat—of the vintage generally found on Cape Cod and in the more or less turbulent waters found off that coast—that responsibility for keeping the boat in good steerageway rested evenly with both master and crew. If the skipper was not onto his job, there were muttered curses, and sarcastic remarks, in an undertone of course, generally winding up with deprecatory remarks about his ancestry, the training they handed down to their grandsons, etc. Then if something brilliant in the way of a tack, rounding a point or snag, was pulled off, he was immediately lifted out of purgatory and became the recipient of smiling adulations from his crew. These men know how to maneouvre a small boat in a rough sea, snatch their bare living from the sea's ever hungry maw, and bring both boat, crew and fish safely home to port. Right here allow me to ask a question. How do they do it, day after day, week in, week out, year after year? The answer is team work. If those men, either skipper or crew, fell down on their working obligations, or stood sullenly aside, neglecting orders or disobeying them, they would be lost and the sea would claim them as its own. They would not create a hole in the water. It would roll on as it always did, and would be ready for more at any time.

Let the trouble makers, the mischief breeders, and those who are given to speaking in whispers in their fellow-workman's ear, molding the bullets for the less intelligent to shoot, mark these words: You may pull a bonehead move, you may disobey your skipper, but he knows it. Oh yes, he knows it, just as well as you do. Can you blame him, if, after port is reached, you are discharged and find yourself facing the cold, unseeing eyes of your erstwhile friends when you seek another job?

But the pity of it is that there are times when a man so rocks the boat that others are pitched into the sea along with him. Then suffering becomes extended when it should be isolated.

The national business boat is being rocked. Not only nationally, but internationally. The responsibility for international stability in business relations rests with greater authorities than we in the textile business, but we in turn must not leave one single stone unturned in our endeavor to keep and maintain our advanced position in the business life of America, and keep the textile business where it honorably belongs, in the very front of American enterprise and industry.

What are the old facts of the textile situation as compared with the new? Twenty-five years ago mills ran long hours on small margins of profit. Mills kept help. Manufacturers were mostly private owners. Their businesses were generally small concerns. Mill owners knew their help in general by their first names. Wages were small. Prices of commodities and costs of living were low. A $5.00 or $10.00 bill taken into the bank on a savings account meant something. There were few strikes. Mill help were contented. Mill help were satisfied with simple things. A best Sunday suit and working clothes almost completed the wardrobe. Mill owners worked every day. There were no automobiles then. An old plug horse, or as the whim of the owner might see it, a pretty good trotter, was all the excitement he had in getting back and forth to work. But work he did, nevertheless. Mill help were clean in their work. Their frames and looms shone, there was pride in their cleanliness, and quality as well as quantity in their product.

The mills in those days were generally lighted with kerosene lamps; then came gas. Windows in the mills were small, and sometimes artificial lights had to be used all day even in the newer mills. But, it cannot be said that the help were not contented. There was team work of the battleship type. Imperative orders and obedient execution.

I remember well a statement made to me by Mr. Harold Lawton, now deceased, formerly general manager of the Lawton Mills Corporation, one of America's finest textile concerns, a man who had had over 50 years practical experience in the mills from a boy piecer up to manager and agent of some of our largest mills. The statement, made 15 years ago, was as follows: "The time will come, and before very long, when mill help will work considerably less hours than they are doing now and will come to the mills for their pay in their own automobiles." Little did I think I would see it come true.

We have the spectacle today of beautifully built mills. We have short hours of labor. We have wonderfully lighted mills, both natural and artificial. Good, clean, cool drinking water is at all times available. High wages are here. Some mill help going to work in the mills are better dressed than wealthy men and women dressed for church 30 years ago. Look into the mill yards and garages as you go by and note the automobiles parked ready for the mill hand coming out of the mill, and ready to take him home.

Mills are now generally corporation-owned. The intricacies and details now connected with a large mill prohibit a mill treasurer from knowing his help to any extent. It may be that some of his help live away from the mill by several miles and come to the mill in an automobile. The mill agent or superintendent may have his machine also, generally he does, as he finds it necessary. A $5.00 or $10.00 bill doesn't go far these days, yet there is all this luxury on all sides. One cannot deny there is more luxurious living now than has ever been known before in the history of civilization, at least here in America.

Is this progress in sanitation, lighting, pure drinking water, nursing, high wages, short hours, automobiles, better housing, and all this community progress, of advantage to mill help in general? It certainly is.

Has it created contentment? No.

That is true. Education creates a desire for better things all the time, and contentment is never obtained. There are newer and higher heights to scale just ahead.

An extra hand employed in a mill 30 years ago to ease the burden of some help in their daily labors was appreciated, but such an action is looked upon today as a matter of course. The point of view has changed all around. The things they should appreciate they do not appreciate. They are forever discontented.

There springs up an imaginary grievance in the mill. The foreman is misunderstood. He tells Nellie she is neglecting her work by spending too much time arranging her hair, or tells Tom he is neglecting his oiling and cleaning, Jim is asleep when he should be sweeping up the alleys, and so on, and the first thing that foreman knows there has been a union meeting, and a strike is threatened. Sometimes they request that the foreman be discharged. Strikes for this, strikes for that, shop meetings for this and that, production harassed and quality kept in abeyance because of the fear on the part of the proper supervisors and overseers that demanding it may bring more trouble. These are the things which show conclusively that textile labor is discontented.

It is not my purpose to try to analyze what has caused this discontent, but it is sufficient to know that it is here, and surely there should be some remedy. There is—it is team work. But a different style of team work than obtained 25 years ago. Knowing the viewpoint of mill help is entirely different nowadays than it was 25 years ago, we must absolutely adapt ourselves to that viewpoint. We know that there is higher education going on at all times. We know that some of our help are as proficient in mill calculations as we are, and cannot be fooled, even if we wished to fool them. We know we are being sized up at all times by those under us. We know that it is the inborn instinct of the man underneath to look up to the man on top as an ideal, as a model, as a pattern if you will. We know that our foremen and overseers are the real men who handle the crowd. Therefore, we must have men in these positions who know human nature, who live close enough to the help to feel their pulse, as it were, who are eternally ready for the slightest development in any way. Men who are absolutely trustworthy and on the level. They must be men capable of organizing and demanding discipline because of respect, not from a militant aspect. An overseer should be a man whom any of his help can go to in their time of trouble, and who will listen and advise with them in a sacred and confidential manner.

Why is it that in these days you will notice some mills have so much trouble and others practically none at all? The answer is that men are in charge of the details who know their business in the one case, and do not in the other. It is a peculiar situation, but nevertheless it is true, that overseers and superintendents have the solution, to a great extent, in their own hands. But the discipline appeal must be made from a different angle than it used to be. The day of imperative ordering and obedience in the mills has gone. There must be mutual team work. Every person in the mill must be made to realize that they must do a full day's work for a full day's pay, and the proper, conscientious overseer will lead the way, by example as well as by precept.

Good work should be recognized, promotion should be encouraged wherever possible and confidence gained. The first thing the help look for in an overseer is confidence in his ability. The next thing is respect. Is he a man that all can respect? Is he a man impartial in his dealings? Will he use all alike? Will he listen to complaints? If he has all of these attributes, shop meetings and strikes, both actual and threatened, will cease. He will be looked upon as a stationary feature of his department, he will be looked up to by all, and his word here, and his word there, will simply mean that such and such a thing must be done, and it is done. There is not the feeling that a slave driver is in charge; there is the knowledge that he is a real man, four square with the world, and worthy to be obeyed. He is above moral corruption.

So, I am trying to convey in this article the idea of team work. It will eventually be realized by labor in the textile industry that merely striking, mischief making and all the other noxious forms of trouble breeding, are the result of disordered minds. The better educated mill help will turn such ideas down, in fact they are doing so at this very moment. It is becoming realized more and more that the only way to retain what blessings we possess is to earn them. High living standards cannot be held, and held indefinitely, unless we work. There must be work otherwise there must be poverty. Artificial living conditions, inflated wage conditions, the luxuries we have accustomed ourselves to during the past few years, were but a result of war, and war business, and the sooner we realize that we must get back to real work and produce, the sooner will business get on a normal basis.

There should be respect for an overseer's responsibilities and duties by his superintendent and this respect should be mutually shown in their daily contact in the mill. No matter what a superintendent or manager may have to say in the line of correction to his overseers, it should be done behind closed doors. If not, then there is discontent, because it radiates from the overseer down through all his help. There should be team work of the highest type on the part of manager, superintendent and overseers. It should amount to something more than a weekly meeting for developing efficiency measures and generally planned before the meeting starts.

There must be sympathy and helpfulness for the overseer with the temporary difficult situation on hand, and his brother overseers must not rejoice in his difficulties. Team work calls for mutual assistance, one to another, and I am safe in saying that of all businesses, the textile business is one that requires the very highest type of team work to get first class results. I will say further that of all positions in a cotton mill the overseer occupies the one of the most vital importance to the welfare of the mill and the success of the manufacturing conditions. Pay him what his job is worth, recognize his worth, make him comfortable enough so that he is not on the look-out for another overseer's job all the time, and the mill will get and hold good, loyal, honest men.

Such a man can be a force for peace not generally realized. Wage adjustments, changes in daily labor, bad running work, and other temporary difficulties can all be left to the real overseer to put through, and nine times out of ten he will do it and do it without trouble. He knows his help, is familiar with what he can put across and what he cannot, and I say, let him go to it, not forgetting to hold him responsible for every move he makes. In fact, the good overseer always makes it a point to keep his superintendent wise to everything he does or proposes to do. But it's

his job. He is the man in charge of the crew. And after all it's the crew that does the work. If the skipper makes a bonehead move, the crew know it, but the mates are generally wise enough to moderate or so word the order that everything is happy. Therefore, let there be mates in charge who know their business; men who know the crew's work as well as their own; men who are always ready to face a rough sea along with the meanest deckhand or scrubber, and then make it worth their while to stay. So organize the mill work that things may be depended to go along smoothly. Create a real team in the plant who will carry things through. If all mill managements will work along these lines, textile America will become a real business leader of today and labor troubles will be a negligible quantity.

Carders Discussion at Columbia

The second sectional meeting for carders and superintendents was held by the Southern Textile Association at Columbia, S. C., on Friday, August 19. There were approximately 100 present, and while this number did not equal the attendance at the first meeting held in Charlotte last December, still those who were on hand and who took part in the discussion made the meeting equally as interesting and helpful as the previous one.

The morning and afternoon sessions of the meeting were held in the ball room of the Jefferson Hotel, and were ably presided over by Marshall Dilling, chairman of the committee on carding, who was assisted by Gordon A. Johnstone, president of the Association, and F. Gordon Cobb, general chairman of the sectional committees.

The morning session was brought to order about 10:30 o'clock Friday morning by Chairman Dilling, who, in a brief talk, told the men that he wanted everyone to feel that he was entitled to the floor. "We are all here trying to benefit each other, and to benefit ourselves," declared Mr. Dilling, "and to get the most benefit out of the meeting we must have plenty of discussion."

Following a short talk by Mr. Cobb, the chairman announced that the meeting would enter into practical discussion, and stated that in the discussion on carding, the first subject to be dealt with would be the pickers. He said that at the previous meeting, they did not come to any definite conclusions on some things, and asked if anyone present had been making tests since that meeting on beater speeds.

Discussion on Picking.

J. A. Chapman, Jr., Inman, S. C., replied to Mr. Dilling's question, "I took your advice and reduced from 1,200 to 925 r. p. m. on the Kirschner beater."

J. H. Yearty, of Savannah, Ga., stated that he was not at the first meeting of carders, but that he had read about the discussion that had taken place at that time. "I was making 1,500 r. p. m. and cut down to 1,000 r. p. m., on Strict Low Middling cotton, and I found that this strengthened the yarn considerably."

"It seems to be the general sentiment to reduce speeds, and I presume that after the men here have reduced to lower speeds, they will get better results," said Mr. Dilling.

"I have been running my breaker and intermediates and finisher beaters at a certain rate of speed," said T. A. Hightower, superintendent, Addison Mills, Edgefield, S. C. "The cotton was Oklahoma and Texas, Middling 1 1/16 inch." However, he declared, he found that the yarn was not as strong as he wanted it, and he found that he could get the best results by running the breaker at 1,100 r.p.m. However, as the yarn was pretty trashy, he continued, he increased the speed of the breaker beater to 1,200 r. p. m. on the blade beater, and got a smoother lap and a cleaner lap. The cotton then went to the Kirschner beater at a speed of 1,000, which also, of course, gave one-third more strokes, and then to the finisher running at a speed of 900 r.p.m. He got better results, he stated, by holding the feed at the same speed as when he was running the beaters at 1,000 r. p. m.

Mr. Cobb asked Mr. Hightower, "Did you notice any increase in the breaking strength?" The reply was, "I got rid of a certain amount of short cotton and invisible waste, and the yarn was better." The breaking strength, he added, remained practically the same on 30s and 40s yarn.

Mr. Hightower pointed out that in reducing or increasing speeds of beaters, it is necessary that the beats per inch be taken into consideration. "If you increase the speed of the blades and do not decrease the feed, you have not done enough," he said.

This speaker added further that about ten months ago, he cut out his intermediate pickers as an experiment, running the lap from the breaker at a speed of 1,100 r.p.m. direct to the finisher. He stated that he found an increase in breaking strength from 56 to 59 or 60 pounds, but that this method did not clean the cotton as well as the three-line process. This was making laps for 30s and 40s yarn, from 1 1/16-inch cotton.

F. G. Cobb was the next speaker. "We are getting other ideas about beater speeds, and I do believe that the cotton being worked has a great deal to do with it," he said. "If I correctly catch Mr. Hightower's idea, he made his changes because of the fact that the cotton was dirty.

"At the Atlanta annual meeting, we had one man, Ralph Webber, of Clover, S. C., who gave a specific instance in regard to the effect of the number of beats on cotton, that I would like to read." Mr. Cobb then made the following quotation from the minutes of the Atlanta meeting:

"With reference to the question of the number of beats per inch (Ralph Webber was the speaker), we have been making a lot of number 20s yarn single, sold on a guaranteed breaking weight of 115 pounds. We made that yarn for three or four years on two processes. * * * * On a later installation of machinery we had two breakers, also an intermediate and finisher. I found out this: On putting that yarn on the new machines, where I had been getting previous to that time 130 to 145 pounds, my breaking strength dropped down to 112 to 120. We went through everything in the plant to help the breaking strength of the yarn, but failed. Finally I told the boys, 'Shove that stuff on the old machines,' and the breaking strength ran up to very nearly the old standard. It came up to within five pounds on an average of the old standard we had. We ran it that way for about three weeks, and we put it back on the other machines, and it came back to the original breaking strength of 115 pounds. The two-blade beaters were running at 1,500 r.p.m. We cut that down to 1,000 and ran the breaking strength up about 5 or 10 pounds again."

"I bring this out merely to show that there must be something in local conditions that should be taken into consideration," continued Mr. Cobb. "Mr. Hightower increased his beater speed on the breakers and did not lose any breaking strength. That was on 30s. I know of another instance where a man had two sets of machines and wanted to put the cotton through more beats and more speeds, but would lose breaking strength. He then put it back like it formerly was running, and he would gain on breaking strength."

A carder in the audience stated that he was getting about 110 to 112 breaking strength on 7/8-inch cotton, and that when he reduced his beater speed from 1,500 to 1,000 r.p.m. the break went up to 116 pounds. He had one section, he said, with a single beater in the breaker, a single beater in the intermediate, and a three-blade, or Kirschner beater on the finisher. In another section he had a porcupine beater, a single beater and then a Kirschner on the finisher.

Beats Per Inch.

"There is another question that came up at the Atlanta meeting that has never been answered fully," said Mr. Cobb. "How do you determine the number of beats per inch? It may be that some of us arrive at the number of beats in different ways? How do you arrive at the number of beats? Do you take the circumference of the feed roll and its revolutions per minute, and the speed of the beater? That is the general method we all use."

"Who can tell us just how many beats they are beating the stock?" asked Mr. Dilling.

Mr. Layton stated that he was beating from 30 to 35 beats to the inch.

E. P. Knowles, Ella Mill, Shelby, N. C., said he was beating 42 beats to the inch.

Mr. Dilling brought out here that the number of beats will of course vary with the weight of the lap. If the lap is light, he said, it doesn't take as much beating, and, on the other hand, the heavier the lap the more beats to the inch.

Mr. Corn gave the following as his beats per inch: 39 on the breaker, 48 on the intermediate and 59 on the finisher.

J. O. Edwards, Lancaster, S. C., said, "I have 24 on the breaker; 50 on the intermediate; and 66 on the finisher. Using two-blade beaters and a Kirschner beater."

Mr. Knowles stated that he had always been told that around 30 beats to the inch was the least that should be given cotton and that 60 beats to the inch was the most. He asked if this was right.

Mr. Dilling replied that he thought that depended on the cotton being run and the lap.

J. E. Robinson, of Wateree Mills, Camden, S. C., said that after much experimenting, they had come to the conclusion that with the Kirschner beater beating about 50 to 60 beats to the inch they could get the best breaking strength for spinning on 1 1/16-inch cotton. Mr. Robinson explained that the dirtier the cotton the more strokes were needed to clean it, etc., and that there should be plenty of beating so as to insure as much cleanliness as possible. He stated that on the intermediate they use a Kirschner beater with 57 strokes, running 1,020 r.p.m.; and on the finisher, with 60 beats to the inch. The breaking strength of the yarn, on 29½s, is 60 pounds.

Mr. Dilling asked Mr. Robinson if he had found that there was any difference in the breaking strength with different beater speeds.

"We have been down to 750 r.p.m. on beater speeds," replied Mr. Robinson, "but we found that the breaking strength did not do any better, so we went back up. When we run around 1,000 on the Kirschner we are just about right. At 1,400 I noticed quite a lot of fly and lint on the pickers and cards."

Referring again to the report given at the Atlanta meeting, Mr. Dilling said that one of the recommendations was this: "Running the beaters at a speed that is just enough to clean the cotton, and not enough to injure it by striking or beating it harder than the delicate nature of the fibers will stand. Around 1,000 r.p.m. is recommended."

"It seems to be the general opinion," he added, "that this is about the best. Some who used to run up around 1,200 and 1,300 have come down to 1,000 with good results."

S. G. Touchstone, overseer of carding at the Richland Plant of the Pacific Mills, Columbia, S. C., gave his lay-out as follows: "We have a three-blade beater on the breaker running 930 r.p.m., giving 30 beats per inch; on the intermediates we have a two-blade beater with 60 blows to the inch, running 1,020 r.p.m. On the finisher we have a three-blade or Kirschner beater which revolves 700 times a minute, and gives 61 blows to the inch. This is on 1 1/16-inch to 1⅛-inch cotton, and making 29s warp and 41s filling. We formerly ran 1,050 r.p.m. on the finisher, but when we reduced the speed on that machine to 700 r.p.m. our breaking strength went up about 10 or 15 pounds."

In regard to changing the speed of the beaters, J. E. Hand, of Savannah, Ga., said, "When you reduce the beater speed, if you don't increase the speed of your fans, you will get bad results because you will not clean the work as good. When you increase the speed of the fan you get cleaner work." Mr. Hand, upon being questioned from the chair, explained that by "increasing the speed of the fan" he did not mean to do this literally, but simply to leave the fan speed where it was with the higher beater speed and then, when the beater speed is slowed down, the fan speed will be greater, in proportion to that beater speed.

"What is a good average setting, on a Kirschner beater, on 1 1/16-inch cotton?" asked T. A. Hightower.

J. V. McCombs, superintendent of the Buffalo (S. C.) Mill, said, "I make no distinction in setting the beater to the feed roll on 1 1/16- or 1¾-inch cotton. I set the beater as close as possible on the Kirschner, probably 3/16 inch, and on the two-blade beater I set it to within about ¼ inch of the feed roll."

Mr. Dilling asked the men if anyone has set a Kirschner beater as close as ⅛ of an inch. Mr. Hand, of Savannah, replied that he sets his Kirschner to a 29 card gauge. One other man gave his setting as 3/16 of an inch.

"About ⅛ of an inch seems to be the most popular setting," said Mr. Dilling. "In fact, I might add that the Kitson people wrote me that ⅛ is what they recommend."

David Clark, of Charlotte, asked if anyone had ever seen any injury sustained by setting the carding beater as close as possible. Mr. Dilling answered that someone had made the statement that they threw out the Kitson beater and later put it back in and set it up as close as they could, and then found that it was one of the best things they ever did.

Mr. Robinson raised the question, "If you get that close (as close as possible) will you not find that there will be a considerable amount of fly and lint and more fuzzy roving?"

"If you run the beater a short time with the belt on the tight pulley," it was explained, "you can find out just what effect the beater has on the cotton. When you set up closer than 3/16 of an inch, I have an idea that when you are striking the cotton 57 to 60 blows an inch you are injuring it. When you are at 3/16 of an inch, there is a tendency to comb out the cotton, so to speak. With this setting we reduced the amount of fly and lint wonderfully. We have not tested it out as to the strength."

"Fly comes from cotton that has been broken," Mr. Dilling pointed out, and again he repeated the recommendation made at the Atlanta meeting, to run the beaters at a speed just enough to clean the cotton without injuring the delicate fibers by excessive beating or striking. Another thing he pointed out is that points on a Kirschner beater will wear out in a few years, and this will affect the setting.

"I think another statement will hold good," added Mr. McCombs. "Some cotton has more tendency to curl than others; Mississippi Benders is more inclined to curl than Upland South Carolina stock, for example. In setting the Kirschner beater I think you should be guided by that. I always try to set the Kirschner beater to where I can turn the beater over.

"I once went into a tire fabric mill in the East where they were having trouble, and found that the Kirschner was set to ¼ inch, using Arizona cotton. I changed it to ⅛ and got rid of the trouble. I was in another mill using 1¼ Sea Island cotton, where they were running the beaters at 3/16. That man's speeds were different from mine—he was running 750 r.p.m. on the Kirschner and I was running 625 r.p.m.—and I think his trouble was in the speed, as I feel that the speed also has something to do with it."

In answer to the question just asked, Mr. McCombs said that he had never seen cotton injured by the Kirschner beater being set close, just as long as it doesn't strike, it is all right.

Mr. Dilling announced at this point that the meeting would pass on from beater speeds and beater settings. "We have talked a good deal about establishing certain standards," he said, "and some talk about this now might do some good."

Mr. Cobb replied, "I believe that the statement you made at the Atlanta meeting could be taken as a standard because it covers the different conditions; and I believe if you will read that statement again and leave it in our minds, so to speak, then if we will make experiments between now and the time of the Charlotte meeting, probably we can give you some more information."

Ball Bearings on Pickers.

Mr. Dilling asked if there was any other feature in connection with picking that anyone would like discussed.

Mr. Knowles, of Shelby, said that he had installed ball bearings and chain drive, but that he had not been able to wind off the lap with evenness. He thought there should be some improvement along that line.

Mr. Dilling then asked if anyone could talk about the friction and the let-off motion on pickers. The friction, it was pointed out, will have an influence on the weight of the lap per yard but not the total weight. "In connection with this question," asked Mr. Dilling, "has anyone measured the length that the lap is supposed to be and compared that with what it actually is? If so, what are the results?"

Mr. McCombs stated that he had found a variation of about two per cent. Mr. Layton said his laps should measure 42 yards, and that they generally were about 44.2 yards. He added that it was his opinion that all the laps would increase in length.

"Why is it that there is a difference in the length of laps with the same line of gears?" asked W. H. Gibson, Jr., superintendent, Union-Buffalo Mills, Union, S. C., and chairman of the Association's committee on weaving.

This was explained by Mr. Dilling in the following manner: "It may be from the friction of the let-off. The way it is wound may make the lap stretch a little. I also think that every one will be a little longer than standard."

Mr. Gibson asked if there would be any effect on the length in starting the cotton, as sometimes it holds away. Mr. McCombs suggested that possibly a lap pin may be worn and cause the friction, and also that it is a good idea to clean the brakes off well.

Mr. Dilling brought up the subject of putting ball and roller bearings in the rack head. He asked if it would be possible to use ball bearings.

A. P. Aldrich, Jr., general manager, Aldrich Machine Works, Greenwood, S. C., replied that they had never applied ball bearings to opener rack heads. A Mr. Tasker, he explained, has a sort of a cup-and-cone bearing that is a big improvement over the old plain bearing. His company has never attempted to replace old logger heads with new logger heads with ball bearings, and he thinks it is better to put in new logger heads altogether.

Mr. Dilling said he has put roller bearings in all of his.

Mr. Edwards, of Lancaster, reported that he is using ball bearings on all platen heads.

When asked what his company was doing in this connection, Mr. Potter, of S K F Industries, Inc., replied that his company had found that the cost was too great to warrant this work.

"The question has been up about ball bearings on aprons," said Mr. Dilling, "and there have been many ball bearings put on the aprons of pickers.

"Since our last meeting I have equipped the aprons on my finishers with ball bearings and I find that it produces much better results and I get a better lap."

"Before I equipped with ball bearings, when I would take the laps off some times I could turn the apron and sometimes I could not, but since I have put in the ball bearings I can pull it and it will run one-third of the way around. Not a little unevenness has been caused by slippage of aprons. If you can make that revolve easily, it will eliminate a lot of unevenness.

"Have you ever found the cotton goes into the feed roll in an even sheet, or does it hold a little bit?" was asked Mr. Dilling. The reply was that the cotton goes through all right.

Mr. McCombs said he had been running them for some months and had found that there was a difference in the weight of the lap, and that the laps would have a tendency to fold a little bit.

"I guess the machinery builders allow for a little bit of slippage, but with ball bearings on the aprons, you can run up to what it is supposed to run."

Mr. Chapman, of Inman, S. C., asked Mr. Dilling if he had reduced his yard to yard variation by the use of ball bearings. Mr. Dilling said he could not give that information, as he had made no tests along that line. Mr. Chapman said he had some pickers equipped with ball bearing aprons, but that he didn't find that he reduced the yard to yard variation. He does, however, lose fewer laps.

"We have a line equipped with ball bearings on the intermediates and finishers," said Mr. Layton, "and I have made a test on laps this week." He then read the results of his tests, which showed generally that there was a little less variation with the ball bearing equipped machines.

"We have found as a general proposition," said Mr. Aldrich, "that you can remove a great deal of friction by

putting anti-friction bearings on evener rolls as well as on apron rolls. The more friction you can remove, the better results you will get, and you will find that the evener roll is causing a great deal of friction."

J. O. Corn, overseer of carding at the Granby Mill, Columbia, S. C., said, "I have two machines fully equipped with ball bearings. I have kept a record in comparison and can see no difference in the total weight of the lap; the record of laps lost shows that the percentage is not over one per cent. I also carried the tests on through the carding and I cannot find any difference."

"I would like to have discussed the positive drive aprons with feed rolls," suggested Mr. Hightower.

"The Kitson people put out an apron made on a chain for a feeder, but they claim that the chain wore out rapidly," said Mr. Dilling. "Whether anyone has tried a positive drive, I don't know. We have had a chain from the front to the back roll, but it is not a positive drive.

Mr. Yearty, of Savannah, said he was the inventor of the positive chain drive put out by the Kitson people. He said they started it on the aprons, but on the breakers it wore out quickly. He stated that at the mill where he now is, he put the positive driven aprons on in 1907, but that in a few years they had worn so badly that he put the leather back on.

"That was with chain," said Mr. Dilling. "Has anyone tried any other type of positive drive?"

J. E. Fields, overseer of carding at the Exposition Cotton Mills, explained the system they had there, of having a gear shaft run from the front roll to the back apron. He said, however, that after making several tests they didn't get better work than was ordinarily the case. This arrangement is in the way, he said.

Mr. Yearty, of Savannah, Ga., explained a device for use on the hopper of the breaker picker which he said has helped him very much. It consists of what might be called a false back, that goes all the way across the hopper and is pivoted at the bottom at a point near the bottom of the spiked apron. When the hopper is full of cotton, this back is forced downward, but as the spiked apron carries the cotton away, a weight at the top, by means of a lever, automatically raises the false back and decreases the angle between it and the vertical. This forces the cotton to stay up against the spiked apron all the time, and insures a regular and even feed.

There was some discussion at this point as to the eveners on different machines, and later the subject was turned to opening cotton.

"I am a great believer in the old method of letting cotton age," said Mr. Johnstone in this connection. "Some very interesting experiments have been made in an effort to humidify the picker room, but the men who conducted these experiments gave it up, as cotton will absorb the humidity so rapidly.

"You know yourselves that we get bales that are damp and bales that are dry. I am an advocate of letting the cotton age at least 24 hours before working it. In this way, the damp bales and the dry bales are thrown together and the dry bales absorb some of the moisture of the damp bales and the cotton is moistened all about the same. I personally do not like an automatic hopper."

After Mr. Johnstone was seated, Mr. Cobb arose and gave some real evidence of the interest and belief that the men are putting into the discussions at the last few meetings. It will be recalled that at the Atlanta meeting, Mr. Johnstone advocated the practice of ageing cotton from 24 to 36 hours.

"From the information that Mr. Johnstone brought out at the Atlanta meeting," said Mr. Cobb, "we went home and started building an opening room which will cost about $4,000 for ageing our cotton. That opening room is almost completed and we hope to carry out Mr. Johnstone's idea in opening up 150 to 200 bales at a time. We will arrange the opening room so that we will have ample room to carry out the idea of Mr. Johnstone in this connection."

Mr. Stillwell indicated his preference for the automatic hopper feed. He said that he can get better work. However, he pointed out, there must be an overflow. "We have our opening room outside the mill three or four hundred yards and have a bale breaker with variable speed drive. We can start up in the morning and we will have about three or four hundred pounds of overflow. We get great results, but you must have a little overflow or you cannot keep the supply regular. We do not have any trouble since we put in the variable speed drive."

Mr. Huskey, overseer of carding at Whitney, S. C., explained a mechanism whereby they can stop any of the five breakers and this machine will feed the remainder. When the fifth hopper runs down it increases the speed of this drive and feeds the cotton in faster. When it gets full it cuts the speed down in the warehouse.

"About the overflow in the hoppers," remarked Mr. Hand, "when you have an overflow your hoppers are full all of the time. I had this experience at a certain mill: They had an overflow and then had a suction to take care of the excess overflow and if any cotton fell down on the floor there wasn't any that got scattered all around."

Discussion on Licker-in Speeds.

"I would like to have something on the speed of the licker-in and its settings," said Mr. Hightower.

"In this connection, I would like to say that I promised Mr. Tatum, of Texas, that we would try and bring out some discussion on this point," added Mr. Cobb, "and I would like for us to get as much information on this as possible, so that he may read about it and possibly make use of it in his own Association out there."

"Who has changed their licker-in speeds?" asked Mr. Dilling to get the discussion started, and called on Mr. Johnstone for something along this line.

"Our experiments were not very extensive," said Mr. Johnstone. "They were on about a thousand pounds on three or four cards. We reduced our licker-in speed from 502 revolutions to 360 revolutions, and the strength of the yarn was about two pounds stronger with the reduced speed. This was on 23s yarn. The yarn was a little evener, but the most noticeable improvement was in the spinning. On the under-clearer rolls there was no fly, showing that the cotton had not been chewed up. Another thing was that the waste was about 1½ per cent less."

Mr. McCombs, of Buffalo, S. C., said he once went into a mill running on Sea Island cotton, 1½-inch staple, where the licker-in was running 585 r.p.m. He reduced this, he said, to 420 r.p.m. and the lint stopped flying off the yarn like it did with the higher speed. He said that he had found that the standard licker-in speed in the East, on Sea Island 1¾-inch cotton is 420 r.p.m. Mr. Gibson, of Union,

S. C., said that 420 r.p.m. would give good results.

Mr. Hightower said his speed was 400 r.p.m. and that he cut it to 338 and got less invisible waste from the spinning, and got a little stronger yarn. This was on 1 1/16-inch Oklahoma cotton. After an experiment with the lower speed he changed all his mill over to that and now has an increase in strength of 1½ per cent.

Being called upon for some information, Mr. Edwards, of Lancaster, S. C., said they had tried cutting down on one card, but that they were unable to tell from their tests that there was any difference in the breaking strength.

"I am setting my feed plate to a 17 gauge," he added, "on 1 1/16-inch cotton for 30s yarn."

Mr. McCombs said that he finds the usual setting is about a 12.

Mr. Hightower gave his setting as 10, and added that he thinks the setting depends a great deal on the weight of lap. He said his is a 10½ ounce lap.

"It also depends on how fast you feed it in," added Mr. Dilling.

In regard to setting the feed plate, Mr. McCombs said, "In setting the feed plate, I think something depends on the style of feed plate. With a short nose you should set closer, say, to about a 9, and with a medium nose set to about a 12."

Mr. Dilling pointed out that cards built twenty or twenty-five years ago had a different shape nose plate from those built today, and asked if anyone had made any experiments with the old and new style.

"We have 48 old cards with short noses," said Mr. Fields, of Atlanta. "I set them to 15 and on the new cards I set to a 17. After I changed to the 17 setting, the spinners were able to run more sides."

Mr. Hand, following a question asked by Mr. McCombs on whether anyone had tried the double licker-in, said that he had a machine known as the Gordon-Hay machine. He said that it turns out yarn as good as combed yarn, and resembles it a great deal. It makes the fiber and sliver fluffy, he said. He declared it better than double carding, but did not notice any difference in the strength of the yarn.

Mr. Wilson said his experience with it had been that it takes up extra floor space and that the fly is much greater. He said, however, that it does nice work, but that it is not as good as double carding in his opinion. He added that it takes all of a section man's time to keep the belt on it.

Going back to the licker-in, Mr. Gibson stated that it depends on the condition of the licker-in as to the settings to use. He said, "We tried setting to a 17 and then to a 22, but we did not get results. We repaired the licker-in and put it back to a 17, and got fine results. It increased the breaking strength from five to eight pounds. We got about 52 or 53 and it went up to 58."

"When pushed for production, our cards are making 158 turns on the cylinder," said Mr. Huskey. "In one room we increased to 170 r.p.m. on the cylinder, leaving the production gear the same. I would like to know how fast you can run the cylinder and what is the best speed."

"I think you can increase to 175 r.p.m. without any trouble," said Jack Horner.

Mr. Edwards said, "I have one card that is running 170 r.p.m. on ball bearings. The others are making 165. There is no difference in the work."

"A speed of 165 r.p.m. is recommended by the machinery builders and engineers," said Mr. Dilling. "If the clothing is a little loose, it will stand a higher speed all right, but the greater centrifugal force created by the higher speed has a tendency to sling the clothing off."

"In a North Carolina mill I was running Mississippi cotton, and the cylinder was running 155 r.p.m. I increased this to 175 r.p.m., with good results. Since then I never run less than 175," said another mi l man.

Mr. Johnstone, of Winnsboro, made this statement, "I have had considerable experience with speeds of cylinders. Machinery men will tell you you can run 175. Mr. Draper told me that I could run a loom just as fast as I could get yarn to stand it." Mr. Johnstone gave it as his belief, however, that a 40-inch card with a 50-inch cylinder should not run over 150 r.p.m.

At this point, the meeting was declared adjourned and the men went downstairs to the Jefferson rathskeller, where they enjoyed a delightful luncheon prepared under the direction of the local entertainment committee. Here, also, they were entertained by several charming and cultured young ladies from the Pacific Mills, who rendered musical and vocal selections. "Pep" was injected into the affair by a jazz band. The young ladies who contributed so much to the entertainment were Misses Nellie and Lucile Mims and Misses Inez and Pauline Broek. After the music and the luncheon, President Johnstone called upon H. A. Newton, superintendent of the Pacific Mills, for a short welcome address, and F. Gordon Cobb responded on behalf of the visiting mill men.

It will be appropriate at this time to introduce the personnel of the Columbia entertainment committee, who arranged the splendid entertainment and provided for the luncheon. They were: S. G. Touchstone, chairman, overseer of carding, Richland Plant; C. L. Drake, overseer of carding, Olympia Plant; J. A. Hamrick, superintendent, Capital City Plant; J. O. Corn, overseer of carding, Granby Plant; R. M. Ross, overseer of carding, Palmetto Mills; and C. R. Costner, Columbia Duck Mills.

The Afternoon Session.

The afternoon session was called to order at 2:15 Friday afternoon by Chairman Dilling.

Before the practical discussion was begun, Mr. Cobb, general chairman of the sectional committee, asked for a few minutes to tell of a plan the Association had under way that would be of interest to the superintendents present. He said, "We have made arrangements to put a man on slashing and warp preparation—and we have selected a man who has had many years of experience on weaving and slashing—who will from now on devote his entire time to making experiments and tests for the benefit of the membership of the Association. He is going to show what should be done with each particular kind of size and compound, and will try to show what the mills are doing with it and where their trouble is.

"We are not, as has been stated, going to advertise nor condemn any one man's product.

"This man is now located at the Lancaster Cotton Mills, at Lancaster, S. C., and is now subject to call from any superintendent or mill at any time.

"Just to give you an illustration of the kind of work we expect this man to do, as you know, we have been trying to find the consensus of opinion on how long starch

should be cooked. One man will say to cook it an hour, that the only way to get the best results is to cook it an hour, no longer, no less, and then another man will come along and tell you to cook it for an hour and a half, for if you don't he'll say, you won't get good results. There is, therefore, a wide diversity of opinion as to cooking corn starch and its ingredients.

"This man is to be equipped with all the paraphernalia that we can find toward getting information. He will be equipped with a microscope and can show you just how your own size looks after it has been cooked, and also at what temperature your starch goes into the slasher.

"This man is L. T. Curry, who has been overseer of weaving at the Lancaster Cotton Mills for quite a while. He is at your beck and call, and will come to your mill at any time you call him. Anything he does at your mill will not be divulged to anyone whatsoever. If he finds something he thinks would be a good thing for the Association, he will ask your permission to give it to the Association. I would be very glad to get all the cooperation possible in starting up this research work."

Discussion on Drawing.

In starting the discussion on drawing at the afternoon session, Chairman Dilling said, "We have come to the point where we realize that the drawing frame is very important, and that it does a very important work, so I want us to talk a little about this process this afternoon. I am first going to ask Mr. Fields, overseer of carding at the Exposition Cotton Mills, of Atlanta, to tell us something about drawing. Mr. Fields, will you give us something from your experience on drawing?"

"I have had experience on single and double process drawing," began Mr. Fields. "When I went to our mill they were using single process drawing, making 23s yarn out of single roving. They had cut out the second process. We put the second process back in, and had enough drawing so that we cut the front roll speed to 225. It also increased the breaking strength 10 per cent.

"Another thing. We were having trouble with kinky filling in the weave room, and I told the superintendent that I thought I could cut this out. This was when we were running single process drawing. I put in the second process and eliminated the kinky filling altogether. The second process of drawing made the fibers much more parallel and they took up more nearly the same amount of twist.

"If you can keep the front roll speed down anywhere around 250, and will use two processes, you can get better results. We have been able to take out 10 per cent of twist.

"The work will also run better with two processes. I had one of our mills on two processes a while before we changed the other over, and all the hands wanted to work in the mill where there was two processes of drawing, so we changed the whole plant over, with the exception of some few frames we use for making yarns for osnaburgs.

"I believe anything finer than 20s should have two processes of drawing," concluded Mr. Fields. "You will eliminate more of the thin places. I have three processes of picking, so as to clean the cotton well, and three roving frames."

David Clark did not agree with Mr. Fields as to the advantages of two process drawing. He said in two or three mills where they had formerly used two processes, they cut one out and got a stronger yarn. He also stated that he had had samples of yarn taken from one process work and two process work, and on submitting these to other mill men, the one process work was invariably selected as the better work. He advocated a 250 r.p.m. front roll speed.

"Several cotton manufacturers who have recently returned from Europe have made the statement that they did not realize before just how much American mills were losing by spinning double roving," said Mr. Clark. The English, he pointed out, do not use double roving on anything less than 40s.

E. G. Waits asked Mr. Fields, of Atlanta, what difference he had found in the variation between the one and two process drawing. Mr. Fields replied that the work was more even with the two processes. "We have a man who does nothing but size up roving and drawing," continued Mr. Fields, "and he told me that the variation was 25 per cent less." In answer to a question, he said they were using 7/8- to 1-inch cotton.

At this point, Mr. Dilling brought out that "in a discussion of combed yarn men, they were unanimously in favor of one process of drawing." However, he pointed out, they get their doublings in their combing process, while the carded yarn mills must be able to keep their stock uniform and their weights and numbers even. However, he said, there is a great diversity of opinion; some favor one process, others are strong for two processes.

The chairman then called upon D. W. League, assistant superintendent and overseer of weaving at the F. W. Poe Manufacturing Company, Greenville, S. C. Mr. League said that he had nothing of value to say; he was a weaver and had come to the meeting to get what information he could.

"Yes," said Mr. Dilling, "we are glad to have the weavers with us. You know, when something goes wrong in the weave room the weaver can always lay the blame on the carder or spinner, and we are glad to have these men here to get our ideas."

Mr. Knowles, of Shelby, N. C., said he had tried one process of drawing as an experiment on two frames. He said the front roll speed was 475, which he cut in half, but that they could not see any difference in the work.

Mr. Dillard, placing himself in the same category with Mr. League, that of a weaver who had come for information, said he couldn't understand what Mr. Fields did to the roving in the card room that cut out that kinky filling in the weave room.

Mr. Fields replied that the only thing he could attribute the elimination of the kinks to was the fact that with the two processes of drawing, the fibers were made more parallel, and took up closer to the same amount of twist. It was explained that the kinks in a piece of yarn will always come in the thin places, and when the yarn is drafted down through the second process of drawing, it becomes more even and gets rid of a lot of the thin places.

Mr. Clark stressed the point here that the English are more particular with their mixing and picking, and that this enables them to run single roving. Mr. Gibson asked him how many processes of drawing are used by the English, but did not receive a direct answer.

"I have a friend who is an English carder," said Mr. Fields by way of answer to Mr. Gibson, "and he tells me that on everything finer than 15s or 20s, they use three processes of drawing."

Mr. Johnstone, in discussing drawing processes, brought

out the point that as the roving goes through each additional process, it becomes smoother and the looks of the yarn improves.

He said that some of the prettiest work he ever made was turned out in an eastern mill using three processes of drawing, with a front roll speed of 91 turns, a 1⅝-inch ring and an 8-inch traverse. The yarn being made was 90s, and each spinner was able to run 1,640 spindles.

"I am English enough to want three processes of drawing," added Mr. Johnstone, "but I can't get it, so I have to be satisfied with two."

"Does Mr. Johnstone find that leather rolls make stronger yarn than the metallic?" asked Mr. McCombs. The reply was that it made it smoother to use leather rolls.

Continuing, Mr. McCombs said, "I once had two mills on Sea Island cotton. One had leather rolls. In that mill the drawing hands were running four frames. It took more drawing hands in that mill than I could get around there.

"In equipping the other mill, I had something to say about it, and I wanted them to put in metallic rolls. The machinery builders thought I was making a sad mistake, but I took the whole responsibility upon myself and equipped that mill with metallic rolls, and the hands were able to handle from six to eight frames. The yarn broke from six to eight pounds stronger than that in the other mill, and from three to six pounds stronger than that in some of the neighboring mills."

The great trouble, Mr. Johnstone, indicated is that there are very few overseers who pay the proper attention to the rolls. Leather rolls, he said, cannot injure the fiber, while metallic rolls can injure the work. The danger is a thousand per cent greater with metallic rolls than with leather rolls, he pointed out.

Mr. Stillwell agreed with Mr. Johnstone that more care should be paid to the rolls. He said that with three processes of drawing they ran into trouble with weak yarn, and when he went around to find the trouble he found burrs on the rolls. He took all the rolls off and went over them with a re-fluting file and after they were put back in the work ran all right.

"While I am on the floor," continued Mr. Stillwell, "I would like to ask for some discussion about cutting out two cans on the drawing frame and running with only four ends."

Mr. Dilling said that he had heard of several instances where they were running with four and five ends, but that he didn't know anything about the details or results. "As you know," he said, "we generally run six ends on the drawing."

Mr. Stillwell continued, "Some time back I tried cutting out two cans and went from six to four ends, and I am sorry to say that I didn't receive any benefit." He reduced the draft, he said in reply to Mr. Dilling's question.

The thought in ever starting that method, explained Mr. Cobb, was to try and cut down on the draft. In some mills, he said, where it was impossible for them to reduce the weight of the drawing, the thing they did was to cut out two of the doublings in order to shorten the draft. This came at a time when there was considerable agitation about the shorter draft.

"I have had some experience with cutting out a process of drawing," he continued, "and would like to suggest to those who experiment with this further, that when they cut out one process they will notice that the slubber roving will be lumpy. If you will increase the draft on the one process of drawing, this will smooth out this slubber roving.

"I think more of us should experiment with these things a little more. When you do begin to keep a record of tests you are making on the breaking strength, don't make an average each day, but merely keep each day's record for a period of days and add it up together. If you have tests over a 30-day period, you will come much closer to the correct figure."

"When you make these tests, extend them over a long enough period so you will know what you are doing," supplemented Mr. Dilling. "On the day to day tests, it is hard for us to tell exactly what we are doing."

The chairman then asked Mr. Newton, the superintendent of the Pacific Mills group, for a word.

"We have not made tests in our mills in regard to the relative merits of single and double drawing," responded Mr. Newton. "We find that just by reducing the speed we can increase the breaking strength, and also are able to get as much work through with the slower speed. At the Olympia Mill we have helped conditions a great deal by renewing the rolls.

"I cannot say anything about the advantages of running double or single drawing, but I have come to this conclusion: If you must cut out one process, I had rather cut out one process of picking than to cut out one process of drawing. We can clean our cotton well enough in the picker room with two processes of picking or two beater processes. We run three, though, on account of evenness. There is a greater doubling effect in the drawing than in the picking."

"You cut out four doublings, you know, when you cut out the intermediate picker," reminded Mr. Huskey.

"Yes, I know," replied Mr. Newton, "the statement I made is, of course, only a theory, but that is the way I look at it."

Mr. Robinson, of Camden, S. C., said, "We put in some frames on single and some frames on double drawing, and ran them that way for a while to make the test. We reduced our front roll speed on the single process from 225 to 175 and increased the weight of the sliver from 54 to 56 grains.

"We ran that way for about six weeks, and then came to the conclusion that the double process was the best on account of the evenness of the yarn. You know, you have your travelers and settings for a certain number of yarn, and if you're running only one process of drawing, I find you will be running numbers from one to two numbers off each way from the number you are supposed to be running.

"I do not think two processes are too much, but I do think three processes is going a little too far.

"When we strike the drawing process in the mill we strike a very vital part," continued Mr. Robinson. "The results are exacting, and detrimental results are disastrous. If you will figure one inch of roving from the drawing, and follow it on through the spinning, you will see what you have.

"The part that holds the spoons on the drawing frame will wear out. It is about 1/16 of an inch across the face of the spoon, and if the drawing frame tender allows waste or lint or dirt to get down in there, it will prevent the spoon from jumping up when an end breaks, and you may get six inches instead of one inch. These are things that may

be of help, but some of us do not watch these things. Every month I go around and look things over.

"I find that changing the pitch of the gears so that they will not affect the drawing so much will help out. I changed ours from a 12 pitch to a 16 pitch, and then in bad wet weather and in bad dry weather, it doesn't affect the tension on the machine."

Mr. Dilling asked Mr. Fields and Mr. Robinson that if they could get the yarn even with one process of drawing, would they prefer it to two processes. Mr. Robinson said that he would.

Mr. Fields explained after the meeting that that was just the point that should be gotten in connection with Mr. Robinson's remarks on the spoons. If a spoon does happen not to work and lets a "singling" through on the first process, then the second process will average this down considerably and make evener yarn. If there was only one process, the "singling" would go through to the fly frames. Mr. Fields intimated, however, that if the yarn could be made as even with one process, he would be in favor of one process of drawing.

"While the discussion on doublings was going on, I figured out the doublings in a mill with intermediate and finisher picker, two processes of drawing, doubling of two on the intermediate, and two on the fly frame," said Mr. Cobb. "I find that this organization will give doublings of 4,608.

"Now, if you cut out the intermediate picker, you will have a total number of doublings of 1,152. If you put that picking process back in, and cut out one of the drawing processes, you get a doubling of only 768. With one process of picking out, you get a doubling of 1,152. With one process of drawing, you get only 768."

The Care of Machinery.

"I have just been sitting here, revolving in my mind the impressions that I get from this discussion," said W. H. Gibson, Jr., of Union, S. C., "and I find that these meetings remind me a great deal of my overseers' meetings, in this respect: The fact is brought out that the men don't keep their minds on their jobs as they should. They will get up and talk about the fancy things that should be done, and some of the things that should not be done, but they let some of the important things slip by them. They will let rolls wear out, they will let gears wear out. They don't pay close enough attention to the details.

"If a hole comes in the floor, they can see that and will put a new plank down. But, gentlemen, it's the boards underneath that wear out on us, and looking just at the surface we can't see them.

"Mr. Cobb made a suggestion at the Charlotte meeting that I think was a good one, and that was to have the overseer or his second hand examine every card that was set up.

"I believe that if we will get the machinery in the shape the builders intended it to be, and keep it up in good shape, we won't have a whole lot of these troubles we've been talking about.

"If Gordon Cobb was to have some trouble with an automobile, he wouldn't drive it until he took it to a garage and had it fixed up in first class condition. If he had a puncture, he'd tell the man to put him on a new tire, so he could ride without having to get out and fix the old one.

"We are having 'punctures' in the mills today, fellows, and it is up to us to look for them. I believe the machines we have are all right. We don't properly keep up what we have."

Mr. Touchstone, of the Richland Mill, said, "I have had a little experience on one process of drawing on 30s yarn. On one occasion we were using low grade cotton and it proved to be good running. We had been having serious trouble for some time and we finally decided that the drawing was too much. We cut out one process of drawing and reduced the front roll speed—and I do believe that it should be reduced—and we got better results and just as smooth a yarn.

"On another occasion, however, I was in a place where it was up to me, and I wanted to try one process of drawing on the South Carolina cotton we were using there. I took out one drawing process and reduced the roll speed to 75 revolutions. My breaking strength went up from 52 to 57. That mill was running plain looms and our production increased on the looms. The quality of the cloth wasn't injured at all.

"I am heartily in favor of one process of drawing and believe it can be worked if due consideration is given to the spread of the rolls and the speed of the rolls. I believe that if it is properly tested out the one process drawing will give just as good results and just as smooth a yarn as the two process."

When Mr. Touchstone had concluded, the chairman called on Mr. Clark, of Danville, Va., for his opinion.

Mr. Clark said that he had had some experience on single and double drawing, and had kept a record of it. Invariably, he said, he had found that he got better work, and better running work, with the two processes than with the single process.

Mr. Huskey called attention at this point to the fact that it will help a great deal if all the slippage or backlash is taken out of the rolls by going around every so often and seeing that the rolls are tight on the keys.

Mr. Anders asked for some discussion on the settings of drawing rolls and what the men use as a base for their settings.

C. R. Costner, Columbia (S. C.) Mills said that he had tried single and double drawing and had kept the double process. He added that he believed the best thing he ever did in the drawing to help it out was to change the card sliver from 66 to 65 grains, change the first drawing from 70 to 66, and the second drawing from 75 to 68. "Of course," he said, "we cut the draft down some and would get better results on our speeders and in the spinning room. I believe this helped out more than anything we have done in this connection."

Answering Mr. Anders' question, Mr. McCombs said that on 1-inch cotton, from a 52 grain sliver, his roll settings on the drawing frame were as follows: First to second, 1⅜ inch; second to third, 1½ inch; third to fourth, 1⅝ inch. Mr. Anders gave the following settings: First to second, 1⅜; second to third, 1 9/16; third to fourth. 1 7/16. This was on a 55 grain sliver from 1 1/16-inch cotton.

The meeting was brought to a close at this point in the discussion, as the chairman stated that the men who desired to return to their homes that afternoon had just about enough time to catch the afternoon train.

Popular Textile Chemistry

BY JAMES A. BRANEGAN,

PRESIDENT, KALI MANUFACTURING CO., PHILADELPHIA.

Glauber's Salt.

If I were asked which chemical I considered the best known around the dyehouse I would unhesitatingly answer, "Glauber's Salt." Go in any dyehouse, cotton, wool or silk, and you will find this great assistant of the dyer.

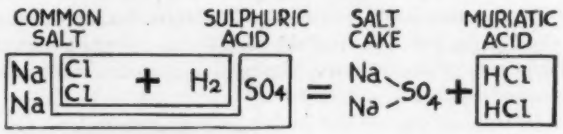
The trade name "Glauber's Salt" is older than its technical name, and in German the word Glaube means faith. For a number of years it was thought that it derived its name from the fact the German people had so much faith in its curative power that they called it "Glaube Salz" meaning Faith Salts. About twenty-five years ago the writer looked this up and found it only partly true, and while it is true the German people had great faith in its curative power it was named after Dr. Glauber, who first discovered its curative powers, and when first put on the market it was known as Dr. Glauber's Salts.

Glauber's Salt is still used in medicine as a purgative, although not to the same extent as formerly and in the "Pharmacopoeia" it is listed as Sodium Sulphate. It is used largely for cattle and horses, mixed with other ingredients to make up the so-called "Condition Powders." Although practically all the Glauber's Salt in common use is made synthetically, there is found in Utah a mineral which is a natural Glauber Salt, but the cost of marketing and the limited quantities prohibit its general use.

The original process for making Glauber Salt was to add Sulphuric Acid to a solution of Soda Ash or Caustic Soda, until the neutral point was reached and then allowing the mixture to stand until the salt crystallized out, the product being Sulphate of Soda which is the chemical name for Glauber's Salt. Today, however, all the Glauber's Salt is made from Salt Cake which is a by-product in the manufacture of Muriatic Acid. The process of making Muriatic Acid is very simple. Common Salt (Sodium Chloride) is treated with Sulphuric Acid either in a closed muffle or in a furnace supplied with movable rakes. The acid acts on the salt forming Muriatic Acid gas which is drawn off and the residue left in furnace or pot is the salt cake. This residue is dissolved in water, and if the operator is careful, it is neutralized and most of the iron removed, after which it is allowed to crystallize and form the Sodium Sulphate crystals exactly the same as if made from Caustic Soda or Soda Ash and Sulphuric Acid.

The chemistry of Glauber Salt and the chemistry of its manufacture is not difficult to understand. Natrium is the technical name for Sodium and its symbol is Na. S is the symbol for Sulphur, and O the symbol for Oxygen. The molecular formula for Glauber Salt is Na_2SO_4. The small figures after Na and O express the number of atoms in combination, and when there is no figure given as after S it signifies one atom, as in chemistry we never put down the figure one. From the foregoing explanation it is easily deduced that Glauber Salt (Sodium Sulphate) expressed as Na_2SO_4 is composed of 2 atoms of Sodium and 1 atom Sulphur and 4 atoms Oxygen, and this is exactly what it is.

The method of its manufacture is as follows: The molecular formula for Common Salt is NaCl, the Cl being the symbol for Chlorine and the formula for Sulphuric Acid is H_2SO_4, and H_2 meaning 2 parts of Hydrogen and all the other symbols were explained in the previous paragraph. In practice 2 molecules of NaCl (Common Salt) are mixed with Sulphuric Acid and the mixture heated, the result being Muriatic Acid (H Cl) and Salt Cake as previously explained. In chemistry this is expressed as follows:



and this is simplified as follows:

$$2\ NaCl + H_2SO_4 = Na_2SO_4 + 2\ HCl$$

From the salt after purification process the Glauber's Salt is crystallized as already outlined. All atoms and molecules do not have the same weight, but their weights are well known, that of Common Salt being 58.5 while Sulphuric Acid is 98. Therefore, if it takes 2 molecules of Salt to 1 of Acid to produce the reaction as shown above we have 2 NaCl ($58.5 \times 2 = 117.5$) + 1 H_2SO_4 (98) and allowing for impurities this is correct 117.5 parts of common salt are treated with 98 parts of actual Sulphuric Acid and the result is Muriatic Acid and the Salt Cake from which the Glauber's Salt is made.

Sodium Sulphate comes on the market in two grades, one is the powdered form (Na_2SO_4) which is known as "Anhydrous Glauber's Salt" and is 100 per cent Sulphate of Soda. The other form is a crystal containing 10 molecules of water ($Na_2SO_4.10\ H_2O$). This is the common form known as Glauber's Salt and is the grade used by most of the dyers. It contains approximately 60 per cent of water. This can be proven by placing a crystal in a warm place such as the top of the boiler or on a radiator, and watch it crumble to a dry powder as it loses its water of crystallization. This dry powder is the 100 per cent Na_2SO_4 mentioned. Some consumers, in order to avoid paying freight on water, and also to avoid paying for extra barrels and handling, now insist on getting Anhydrous Glauber's Salt (anhydrous means without water), and a few manufacturers now make the Anhydrous form especially for the dyehouse. On account of its economic properties the writer believes this form will eventually be used by all dyers. There is another form containing seven molecules of water ($Na_2SO_4.7\ H_2O$) but this is rarely manufactured, and corresponds very nearly to the mineral Glauber Salts which is found as a brownish crystal in some of our western states. This form is soluble with difficulty, which is a disadvantage in the dyehouse.

Glauber's Salt is used extensively in cotton, wool, and silk dyehouses and when so used it should always be weighed out as an excess tends to make the dye too soluble with the result that the dye works off instead of fastening to the fibre. In the manufacture of dyestuffs the finished dye usually varies in color and Glauber's Salt (anhydrous) is used to bring the color to a fixed shade. This is known as

standardizing and large quantities of Anhydrous Glauber's Salt is used for this purpose. It has other uses particularly in the anhydrous form (Sulphate of Soda). In glass making it is used as a flux, and it is one of the principal ingredients of the pigment known as Ultramarine Blue. It is used in medicine as mentioned and the fine crystal grade is found in most all "cattle and horse condition" powders. It is also used in the chemical laboratory and occasionally for smelting and refining metals and in the manufacture of Silicate of Soda. The grade used in manufacturing processes is known as the "technical grade," that used in medicine as "U.S.P." and the laboratory grade as "C.P." The last named is the purest.

Chemically, Glauber's Salt is a neutral salt and is one of our most soluble chemical salts, water taking up large quantities, but it is insoluble in alcohol. Next to Sodium Chloride (Common Salt) Glauber's is probably man's most useful salt.

The next article will be on Sulphuric Acid.

Expositions.

(*Continued from page* 806.)

most familiar to southern textile manufacturers is that of the Southern Textile Exposition. From an inauspicious beginning in 1915, backed by men who anticipated its usefulness and its possibilities, the Greenville Show has developed into an essential institution in the southern textile industry; housed in its own building, a magnificent structure, its biennial sessions are regularly proving that it is a worthy representative of the industry. These are facts known to every one connected with the industry in any way.

And now another kind of exposition is coming to Textile Hall, the first of its kind to be promoted, and one which will undoubtedly make for itself a place in the industry and prove itself an excellent alternate attraction to the Southern Textile Exposition, whose promoters are its promoters and whose building it will share—it is the Textile Products Show, which will be conducted for one week beginning October 6.

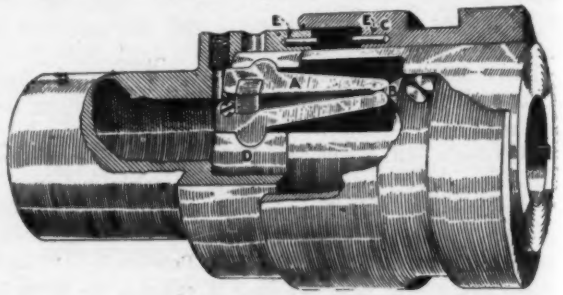
This exposition, as intimated, is to be the pioneer in its particular field, different from any that has been staged heretofore. As such, it is perhaps to be expected that it will not be considered by all with the same degree of enthusiasm and confidence that is being manifested by those who have carefully investigated its possibilities, just as some looked askance when the Southern Textile Exposition came forth from an idea into a reality. Also, it is, perhaps, somewhat difficult to accurately estimate the real value of such a proposition in an undeveloped state.

The directors of the organization behind it have, however, completely outlined their plans for this newcomer in the exposition field. Its primary purpose will be to exhibit all kinds of products that are made from cotton and cotton yarns. This will, of course, include an almost illimitable variety of commodities, as previously outlined in COTTON'S columns. Also, from time to time have been mentioned the other features of the Show, such as the plan to have present a number of foreign importers or their representatives in this country.

The southern mill man will be on the other side of this Show, so to speak. He will have the opportunity of being the exhibitor. Upon the degree of success that attends this first endeavor will depend the future progress and development of this new project. Expositions pay, and the Textile Products Show will offer itself as a medium to the mill man to exhibit the product of his spindles and his looms.

A Positive Locking Friction Clutch.

A friction clutch that will allow the starting of its load under friction only, and thereafter furnish a positive locked drive against slippage, when the clutch is completely engaged, is rather a new development and will no doubt prove of decided advantage on a variety of mechanical drives where such an arrangement is desirable. Such a device has been brought out by the Carlyle Johnson Machine Co., Manchester, Conn., manufacturers of the Johnson friction clutch, and it is pointed out that this is not a new clutch design, but is merely a modification of the stand-



ard Johnson clutch that has been on the market for more than twenty years, the locking feature having been developed to cover a specific need in certain instances.

This new device, a semi-sectional view of which is shown in the illustration, consists of a body that is fastened to the shaft and carries a split ring in which are inserted a pair of toggle levers A. The lever is forced apart by a curved wedge B, which is made a part of a sliding shipper sleeve C. This expands the ring D, bringing its outer surface into frictional contact with the inner surface of the friction cap.

The positive locking arrangement consists of six pairs of opposing pins spaced equally distant around and on the edge of the friction cap and on the shoulder of the outside shifter sleeve C. These pins, shown at E, are shown in the disengaged position, as are also the friction surfaces. As the sleeve travels to the left, the friction surfaces begin to take their load and practically pick it up to full speed before the opposing pins come into contact. With the full throw of the clutch the pins become engaged as a locked drive and slippage under load is thus eliminated.

The National Aniline & Chemical Company, Inc., will be represented at the Seventh National Exposition of Chemical Industries, New York, by an exhibit that will show the remarkable advances that have been made in the manufacture and development of coal-tar dyes. The setting of the exhibit will be essentially Egyptian in design, and embellished with ornamentation carrying out this main idea. One of the features of this design being a frieze in several panels, portraying groups of ancient Egyptian workmen engaged in some of the operations of the tinctorial arts. The decorative effects have been very carefully considered and will show one of the avenues of usefulness of "National" dyes.

Slashing Cotton Warps

BY WILLIAM B. NANSON.

The sizing of the warps on the slasher is the most important preparatory process to which cotton yarn is subjected previous to being woven into cloth. The operation is carried out, in the first place, in order to give the warp yarn the necessary strength and elasticity to withstand the jar and friction of the reeds and harnesses during weaving; and, in the second place, to give a certain feel and appearance to the woven cloth; and, lastly, to sometimes increase the weight of the cloth over and above that of the cotton contained therein.

The sizing of yarns dates back as far as we have any history of woven cotton goods. In the days of the hand loom it was customary for the weaver to first pass the warp threads through some adhesive substance, such as flour paste, and afterwards dry them. This gave the desired strength but rendered the yarn too harsh and brittle for successful weaving. In order to reduce this harshness, and to render the yarn pliable, tallow or oil of some description was added and this gave all that was required for successful weaving under the conditions in which this operation was then carried out.

Since those days, clever brains have devised machinery whereby sizing is carried on at a high rate of speed and under the most favorable conditions for output, and many substances other than flour paste and tallow have been introduced into size making.

The machine adopted to treat and size the warp yarn as it comes from the warper is known as the slasher and its objects, briefly stated, are as follows: (1) to coat each thread of warp yarn evenly with size in such a manner that the size will partly penetrate and adhere to the thread without the threads adhering to one another; (2) to dry the sheet of warp after it has been sized; (3) to run the desired number of threads on a loom beam in an even sheet and in such a manner that the sheet will unwind at the loom without obstruction and pass through the harnesses and reed without unnecessary breakage and with the least trouble to the weaver.

So far as the dressing is concerned it should be so that it will carry well through the harnesses and reeds without injuring the warp yarn, and yet allow the loom to beat up the filling in good shape without cutting the harness. Consideration of the local conditions of the weave room where the work is to be woven must have some weight, whether it is a damp cold place, or a dry room where plenty of dry air is constantly passing through, or on high ground or near a river where damp air, as a rule, settles; also, the style of loom used, as looms vary in length of crank which makes much difference as to how the warp should be dressed; or, again, what processes the cloth may be required to go through after being woven; for what would, perhaps, be a good weaving size cannot be used on account of the effect some of the ingredients would have on some of the subsequent processes of finishing.

The practical slasher-man must take all these circumstances into consideration to be able to give entire satisfaction where the work, circumstances, and locality are very different, or where there are many different kinds of looms, some, perhaps in basements near running water, some, perhaps, in top rooms where an even temperature is generally kept and that probably dry.

In cotton mills producing cloth the production depends entirely upon the output of the weaving rooms and the output of the weave rooms is dependent largely upon the quality of the warps as represented by the dressing they get upon the slasher—in fact, good slashing is the main factor in the financial success of such a mill.

All of this goes to show that the man in charge of the slasher should not only be able to manage the help and see that the machinery is kept in the best running order and the work generally attended to, but he should thoroughly understand the requirements of the various kinds of cloth being woven in its relations to sizing and be competent to make up just such a size as will give the best results, taking into consideration all the circumstances of the case.

A slasher-man should understand his machine thoroughly and the nature of his sizing compositions, and not work by "rule of thumb."

In making size for the various products of cloth there is a vast difference between the "rule of experience" and the "rule of thumb." To an outsider it may look like guess work, but to the man of experience, though he may not be able to readily figure out just how many pounds and ounces in this or that ingredient, yet as he sees how the work is running in this or that room, or at this or that time of the year or place, he can readily give instructions on how to dress this or that kind of work for the different places, and also what to put in or leave out of the size; and if there is a man in a cotton cloth mill upon whose judgment and care its success depends, according to his ability, it is the slasher-man.

There is much bad work in our weave rooms that might be remedied by a more thorough knowledge of the finer points of dressing and it would be profitable for all concerned to know all the changes which take place as one ingredient comes into intimate contact with another during the process of boiling. The foundation principle of sizing may be seen as we notice a seamstress wax or wet her thread so it will not be frayed away by friction in passing through the goods. Thus we may trace the need of the different kinds of size, from the heavy size for coarse, strong work down to mere alum water, or little better, for fine lawns, etc. We all know that sizing for manufacturing purposes has gone far beyond this for not only has it favored the warp threads in their passage through the harness and reed, but it has taken a great part in adding to the weight and finish of the goods.

As a great deal of bad work can be made in a very short time on the slashers, it is important to have these machines in perfect order. Taking good care of slashers amply repays every consideration given to them. Work spoiled there is almost beyond repair or of no use. Even when slashers are in good working order, careless handling by attendants is sure to make much waste material. The following is a partial list of bad work that can be made by a careless slasher tender, even when the slasher has no mechanical defects:

Hard sized places in spots on a warp; warps over-filled;

crossed ends; ends left out; over-sized or hard warps; under-sized or soft warps; warps wound on the beam too hard; warps wound on the beam too soft; yarn cut by compression roll at each end of loom beams; stretching the yarn too much between head end and cylinders or cylinder and section beam rack, or both; warp too large or too small at one end; bad selvages; dirty size used; irregular sizing, one warp hard, another soft, etc.; warps leased wrongly; too many warp pieces caused by smashes; waste of size, of yarn, of other supplies; warps imperfectly dried; warp not fastened to loom beam, causing it to slip and turn on the barrel; too many smashes in full warps.

There are also many other minor defects in the work, most of which, as well as those already enumerated, are the effects of the following causes:

Ill-kept and dirty machine and connections; machinery improperly geared so as to stretch the yarn; improperly mixed and cooked size; broken teeth in front roll driving gear; slippage of yarn on too small a front roll; piping so arranged as to allow hot water to leak into the size feed and kettles; steam and heat wasted; worn out friction discs; fans stopped or running too slow; imperfect squeeze rolls; leakage of size tank and size feed pipe plugged up every morning; loom beams warped crooked; presser bars not in use, causing ends to roll in front of slasher. And so forth and so on.

Speaking in a general way, in slashing there is a great danger of overstrained warps causing them to be brittle and flat, with saw tooth edges; these cut and wear out the harnesses as well as break in the weave room, thus cutting down the weave room production. There is also the danger of making too much waste on the slashers both back and front; of warps not sized uniformly and of under production. To avoid all this a good well-kept slasher is necessary, run by a thoroughly competent slasher-man, and a careful record should be kept of the operations, their results and cost, and the final results of each machine.

I would point out here, that in the case of a small mill making cloth *all* the goods made in that mill pass through, perhaps, *one* particular slasher and under the skill and care of *one* particular slasher tender, and that the condition of that one machine and the skillfulness of that one man can easily make for or against the whole production of the mill and its ultimate dividends; this condition also prevails in larger mills in the same proportion. Hence the importance of having a good machine and a faithful experienced man to run it. Any extra care and attention which may be given to a slasher will be amply repaid by an increase in production and better and more even running work.

For sizing cotton yarns, the cylinder slasher is used (Fig. 1), except in rare cases of very heavy yarn and a large number of ends, which it is advisable to handle in a slasher of the hot air type of construction.

For woolen, worsted and spun silk yarns, the hot air type is used almost exclusively, but the general type in use for cotton yarns, both in America and in Europe, is the cylinder slasher, usually with two cylinders, and this is the type of machine to which I shall confine myself in the present series of articles.

All slashers should be made up in four distinct units, that is, head end (marked D in Fig. 1); center frame (C), containing cylinders and carrying rolls; sizing box (B); and creel for the warper beams (A). This style of construction gives a flexible frame and removes the great strain imposed upon a machine built as a single unit through the settling of floors and the variation of load in the different parts of the machine.

Figure 1 shows a sectional view of a two-cylinder slasher. Referring to this figure, the passage of the yarn is as follows: The requisite number of section beams, A1, A2, A3, A4, A5, A6, are placed in the creel A and the ends from these beams are passed over the guide rolls, B, B1. The yarn then passes through the size box C, which contains the size, being guided under the immersion roll C2, then between the size roll D and the squeeze roll E, and then between the size roll D1 and the squeeze roll E1. From the squeeze rolls of the size box it passes to the cylinders H and J, but in order to keep it under the influence of these drying cylinders as long as possible so as to increase the area of their drying surface, the warp is carried in a circuitous path, first to the large cylinder H, and then to the small cylinder J, passing partly around both. In this manner about 50 feet of warp is under the influence of the drying arrangement at one time. From the cylinder J, the yarn passes under the cooling fan K, and partly around three guide rolls B2, B3 and B4.

This method of sizing and drying the warp on the slasher has a tendency to cause the individual threads to stick together; consequently, to remedy this, split rods, known also as separating bars, M, M1, M2, M3, M4, are introduced to divide the warp horizontally into as many sheets as there are section beams in the creel. The warp next passes through the expansion comb N, and over and under tension rods, then partly around the measuring roll P, then partly around the drag roll R and guide roll Q, and then onto the loom beam S on which it is wound in an even sheet. The tension rods aid in regulating the tension of the yarn between the cylinders and the drag roll, while the third rod simply serves as a rest for the operator in placing the ends in the dents of the expansion comb N.

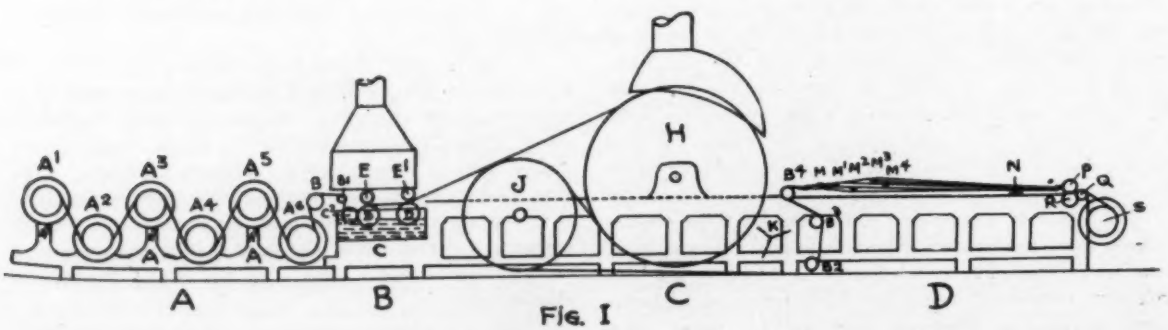


FIG. I

Creels.

Creel stands (A) are arranged in sections, each holding two beams; and, therefore, are readily furnished in multiples of two. These stands should be designed to receive beams with 24-, 26- or 28-inch diameter heads. Adjustable bearings should be supplied so as to make it possible to use beams of larger diameter heads and also the use of beams varying about six inches in length between bearings.

A truck creel is used when the lease arrangement is necessary, but this form of creel will not accommodate beams over 24 inches in diameter.

It must be remembered that it is not always necessary to have the number of section beams equal to the capacity of the creel, since if five or even four beams can be made to hold the required number of ends most advantageously, that number should be used. In any case, however, it is first necessary to determine the number of beams to be used and the number of ends to each beam, in order that the total number of ends from all the beams will be exactly equal to the number of ends that is needed on the loom beam. For instance, suppose it is desired to place 2,438 ends on the loom beam; then it will be possible to have three section beams of 490 ends each and two section beams of 484 ends each, the total number of ends being 2,438.

These five beams should be placed in the creel in two tiers, three in the lower tier and two in the upper tier, since it is customary when filling the creel to commence at the end nearest the size box.

When there is no difference in the length between heads of the several section beams, the beams carrying the most ends should be placed nearest the size box; but if the beams vary in the space between heads, the widest beams should be placed nearest the size box, no matter what may be the number of ends on the different beams. This must be done so as to allow the sheet of threads coming from the rear beams to come in between the beams ahead of it. If this is not attended to, the threads from a wider beam will rub against and most likely overrun the edge of a narrower section beam placed ahead of it.

The following is the mode of procedure in taking off the yarn from the section beam. Referring to Fig. 1, the slasher-man first takes the yarn from the beam A1 and passes it under the beam A2; this causes the sheet from A2 to come above that from the beam A1. The ends of these two rear beams A1 and A2 are then passed over the beam A3, when the ends from this beam, A3, are joined with those from the beams A1 and A2, the ends from the beams A3, however, are lying under those from the two other beams. In a similar manner the yarn is passed under the beam A4, over the beam A5, and under the beam A6, the sheet of yarn from each beam being combined with the yarn from the preceding beams as the sheet of warp passes that beam. Therefore, if we consider the sheet of ends from each beam as a solid body there would be six distinct layers passing over the roll B, the three from the lower beams being above the three from the upper beams, and the whole being arranged as follows: The top layer is made up of ends from A6; the next layer consists of ends from A4; the next of ends from A2. Then the next layer consists of ends from A1; next the ends from A3; and then the ends from A5. What really does happen in practice is that the ends from all the six section beams are spread out into one even sheet, which is quite necessary for even and thorough drying on the cylinders.

At the beginning of a set, and also at frequent intervals while the set is running, lease bands should be inserted at the creel between the sheets of yarn at each point where the yarn from one beam joins with the sheet of yarn from another beam. If there are six beams in the creel as in Fig. 1, five bands are inserted, three of them being laid across the warp yarn from above and two from below. These lease bands may consist of pieces of cord, or what is better, a number of ends of warp yarn.

So that the bands may be in position to be inserted between the sheets of warp from beneath, the two that are to be raised from below the warp yarn are placed on the floor crosswise of the creel and directly under the points where they are to be inserted. To place the bands in position, the slasher-man uses a rod of the same length as the width of the creel and by passing one end of the band around the rod the band may be inserted and the rod removed. As the machine is run at a slow speed, the first band is inserted; that is, the one that is laid above the warp between the section beams A1 and A2. When this band has gone forward a band is raised from beneath the warp between A2 and A3 and allowed to go forward; then one is placed above the warp between A3 and A4; then one under the warp between A4 and A5; and finally one above the warp between A5 and A6.

Care should be taken to keep the ends of the lease bands from overhanging the beam flanges, but just before the warp enters the size box they should be folded over the edges of the warp so as to prevent them from being drawn out or getting entangled in going through the machine. As the bands reach the front of the machine the split rods are inserted in their place, as will be explained later.

Breakages of ends and other accidents during the operation of the machines sometimes disarrange the position of the threads and it is therefore advisable once or twice during the running of a set to repeat this operation of inserting lease bands. For very particular work, or for tender yarn, it is advisable to take a fresh lease for every loom beam that is filled.

It is customary in all well equipped slasher rooms to provide an overhead track and tackle for raising the section beams and putting them in their places in the creel at the back of the slasher. One of these tracks is situated over each creel and by its use it becomes an easy matter to carry the section beams along the track to their places and lower them into position. Where very large loom beams are used it is also desirable to provide a track and tackle at the front of the machine by which the loom beams can be removed from the slasher.

Size Box.

Size boxes are better made of cast iron throughout, the body being cast in one piece. A standard box for cotton work measures 9½ inches from bottom to center of the size rolls and 12 inches between centers of the rolls. It contains two size rolls, two squeeze rolls and one immersion roll, two wood carrying rolls and a drop roll. This box holds about 50 gallons of size when filled to the center of the size roll.

The size is sometimes kept hot by means of steam admitted through a perforated pipe in the bottom of the box.

A steam jacketed box may also be used; in this case the steam is admitted to a chamber at the bottom of the box which keeps the size hot without diluting it by the admission of wet steam. The writer prefers the standard per-

forated pipe, however, for keeping the size hot, with the circulating device, as will be shown later when we come to "sizing."

For handling colored yarns which are not fast, a single roll upper size box is necessary, supported above the regular size box by suitable stands. This box should be furnished with one squeeze roll, one size roll, and one immersion roll, and should be 6½ inches deep to the center of the size roll.

The size rolls should be made from seamless copper tubing turned to nine inches in diameter, the heads may be of cast iron, but brass is advisable, especially if corrosive sizing mixtures are likely to be used, and brass is also more durable than iron. The shafts should extend through the full length of the rolls and internal discs or heads should be used for stiffening them. The size rolls are gear driven as they and the drag roll on the slasher head must all run at the same surface speed.

The immersion roll is regularly made of heavy brass tubing five inches in diameter.

Squeeze rolls are made of solid cast iron and vary in weight according to the weight of the warp. An approximate rule for determining the necessary weight of squeeze rolls for sizing cotton warps is as follows: Multiply the square root of the weight of one yard of warp by 1,000. The first roll should usually be about 100 pounds lighter than the second. The face of the squeeze rolls should be rough-turned to provide a good surface for covering. These rolls should be covered with a high grade wool fabric to the depth of about ½ inch. Methods of covering vary with the requirements of the mill.

[This is the first of a series of articles by Mr. Nanson on slashing cotton warps. The next will appear in an early number and will deal with size mixtures, etc.—The Editor.]

Callaway Received His Cane.

Fuller E. Callaway, of LaGrange, Ga., former president of the Cotton Manufacturers' Association of Georgia and the American Cotton Manufacturers' Association, and a well known and successful southern cotton mill man, recently landed in New York on his return from an extended tour of Europe. He is optimistic on business conditions and reiterates the advice, cabled his associates last May, that they emulate Joseph of biblical fame by accumulating stocks of cotton while plentiful to provide for times of scarcity.

As the steamer slowly approached the dock for the landing, Callaway could be seen standing on the deck with his smile, his cane and his optimism, surrounded by a group of friends. These features are symbolical of Callaway—he always has them with him. In this connection it may be well to tell the finish of a story we began in the July number of COTTON.

It will be remembered that while the members of the Cotton Manufacturers' Association of Georgia were assembled at Philadelphia in convention, they became greatly perturbed because someone suggested that Callaway had gone abroad and that perhaps in his haste had neglected to carry with him his cane, or his "stick" as our British cousins know it. Therefore, when the suggestion was made to send some little token of remembrance to this absent member, a "stick" was the unanimous choice. W. J. Vereen and S. Y. Austin were made a committee to look after the matter, the cane was purchased, and the following inscription engraved thereon:

"Presented to Fuller E. Callaway by the members of the Georgia Cotton Manufacturers' Association as a token of their appreciation, esteem, and respect."

While S. Y. Austin, who was a delegate to the World Cotton Conference, was made a committee of one to present the cane to Mr. Callaway, he evidently did not feel equal to the task after a several weeks sojourn outside the three mile dry limit of the United States as he sub-let the contract to Frank Nasmith of Manchester, England, the secretary of the World Cotton Conference. This isn't the excuse Austin gives, but—well, anyway he admits he didn't see Callaway and Callaway isn't so small that people usually overlook him. Under the circumstances Austin's apologies are accepted at their face value, but should a similar occasion ever arise it is probable that a committee with a greater carrying capacity, a greater tonnage so to speak, will be selected.

On July 15th Callaway had a birthday. He does this about once a year, although he has been advised by some of his lady acquaintances that if he doesn't quit it he will find himself growing old some day. As it happened this year while he was in Manchester, England, a party of his British friends, headed by Fred Holroyd, vice-president of the World Cotton Conference and president of the Master Cotton Spinners' Association and Captain J. S. Addison, director of the Calico Printers' Association, and including a number of other gentlemen prominent in the manufacturing industries in the Lancashire district, decided to give him a birthday dinner at the Midland Hotel in Manchester. And it was this very pleasant and opportune occasion that was chosen by Mr. Nasmith for carrying out his part of the contract and presenting to Mr. Callaway the handsome "stick" that had been intrusted to his care by Mr. Austin.

This brings us back to where we started, with Callaway standing on the deck of the steamer with his smile, the cane, and his optimism. He's proud of that cane, too. If you don't believe it ask him. He'll tell you about it better than we can.

The Lovingood Company, 14 Walker Street, Atlanta, Georgia, factories branch for shipping room supplies and other related products, announce they have opened warehouse branches in Greenville and Spartanburg. These warehouses will carry complete stocks of Signode strapping systems and bale ties for the convenience of the trade in the Carolinas, and orders will be shipped directly from these points. It is another indication of the furtherance of the policy of good service adopted by this company. The Manufacturers' Warehouse Company will handle the products at Greenville, and the Carey Transfer & Storage Company has been selected at Spartanburg.

The National Aniline & Chemical Co., New York City, have issued a booklet of instructions for the use of Nacco garment dyes, in connection with the color card recently distributed. It contains useful information on the cleansing of garments for redyeing and the application of color on fabrics.

GREER PLANT, VICTOR-MONAGHAN MILLS, GREER, SOUTH CAROLINA.

Following a request from about 200 former employees for work, the Locke plant of the Locke Cotton Mills Company, at Concord, N. C., resumed operations on Thursday, August 11. At this writing, about one-half of the machinery at this plant is in operation, with additions being reported daily to the operating force.

The opening of the Locke plant was the first break in the general textile strike which has been in force in the Charlotte-Concord-Kannapolis section of North Carolina since June 1, when the operatives left their machines and walked out, objecting to a reduction in wages in excess of 22½ per cent from the highest wages paid.

At the Locke plant, however, the strike had been going on since February 22, when the operatives declared a strike for the same reason the general strike was called four months later. Other plants in Concord affected by the general strike are the Brown Manufacturing Co., the Norcott Mills, the Cabarrus Mills, the Gibson Mfg. Co., the Hartsell Mills, the Franklin Mills and the Brancord Mfg. Co., as well as the mills of the Cannon Mfg. Co., at Concord and Kannapolis. The Hartsell Mills resumed operations on Monday, August 15. With one other exception, the mills in Cabarrus County are all closed at this writing, the exception is the Cannon Mills at Kannapolis which resumed operations on August 17th, with about a third of the full number of operatives.

When the gates of the Locke plant were opened for those operatives who desired to return to work on the 11th, it was necessary for these people to push their way through a crowd of several hundred picketing strikers, and while those who entered the mill yard for the purpose of returning to work were subjected to hoots and jeers, no actual violence was reported.

The plant resumed operations after an agreement between the management and the officials of Concord that sufficient police protection would be given to the mill and to the returning workers, and also following the adoption of a stringent anti-picketing law by the Board of Aldermen of Concord which makes violation of the ordinance punishable as a misdemeanor and by a fine not exceeding $200 or imprisonment of not over 90 days. As this is probably the first anti-picketing law ever enacted in the South, and as its application and effectiveness will be watched with much interest by manufacturers in this section, the complete text of the ordinance is reproduced herewith. It reads as follows:

Bt It Ordained by the Board of Aldermen of the City of Concord:

Section 1. That it shall be unlawful for any person or persons, singly or by conspiring together, to interfere, or to attempt to interfere, with any other person in the exercise of his or her lawful right to work, or right to enter upon or pursue any lawful employment he or she may desire, by doing any of the following acts, to-wit, by congregating in front of, around or near any manufacturing plant or other place of business for the purpose of intimidating, inducing or influencing such person to quit his or her employment or to refrain from seeking employment; by using profane, insulting, indecent, offensive, annoying, abusive or threatening language toward such person, or any member of his or her immediate family, or in his, her or their hearing, for the purpose of inducing or influencing or attempting to induce or influence, such person to quit his or her employment, or to refrain from seeking or freely entering into employment, or to persist in talking to or communicating in any manner with such person or member of his or her immediate family against his, her, or their will, for such purpose, or to follow or intercept such person from or to his work, from or to his home or lodgings, or about the city, or to photograph such person against his will, or to menace, threaten, coerce, intimidate or frighten in any manner such person, for such purpose, or to loiter about, picket or patrol the place of work or residence of such person or any street, alley, road, highway, or any place, where such person may be or in the vicinity thereof for such purpose, against the will of such person.

Sec. 2. Any person violating this ordinance shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not exceeding $200.00, or imprisoned not exceeding ninety days.

Sec. 3. That this ordinance shall take effect immediately.

George H. Richmond,
City Clerk.

Concord, N. C., Aug. 5, 1921.

While this ordinance was adopted prior to the re-opening of the Locke plant, and should, if strictly enforced, provide ample prevention of picketing or other interference with the right to work, and though no "rough stuff" was in evidence upon the immediate opening of the plant, on the successive days the plant has been running up to the present, the picketing of the plant has increased and those who are working have been so molested and abused, that it has been deemed necessary for the preservation of life and property to have the Governor call out the Concord and Charlotte military companies.

This action came as a result of a request from the Chief of Police of Concord and the Sheriff of Cabarrus County stating that they were unable to maintain law and order and enforce the law. These requests were augmented by a formal request from the Mayor, and two companies of approximately 100 men each are now on duty. The Concord company was stationed at the Locke Mills and the Charlotte company was placed at the Hartsell Mills.

A number of arrests of both men and women have been made for violations of the anti-picketing law, though there is wholesale violation by crowds of 700 or 800 men who gather regularly around the plant and threaten and intimidate those who have returned to work. The Locke Mill officials state that if sufficient protection can be secured for their property and the safety of their operatives, the mill will continue to operate, but that they have despaired of getting protection from the Concord police and the county officers.

The annual picnic of the Osceola, Clara, Dunn, Armstrong, Seminole, Victory, Winget, Mutual and Piedmont Mills, was held in Gastonia, N. C., on August 6, with more than 2,000 people in attendance. The usual picnic features were provided for the amusement and refreshment of the large crowd, but this year there was an added interest in the event for those connected with the mills—the occasion was selected for the unveiling of a handsome bronze memorial tablet in memory of the late Colonel C. B. Armstrong, the former head of this string of mills.

The activities of the day were started at ten o'clock Saturday morning, and the general theme of the occasion—the emphasizing and promotion of community spirit and interest—continued throughout the day. Community singing was enjoyed, and several excellent speakers were heard, the general subject being community spirit, its benefits and advantages. At four o'clock in the afternoon, the bronze tablet was unveiled and dedicated to the memory of Colonel Armstrong with impressive ceremonies.

Construction work on a graded school building of eight rooms, which will be of brick, with steam heat and all conveniences, is progressing nicely at the Republic Cotton Mills, at Great Falls, S. C. This mill also has a Baptist church under construction.

It is announced that the hydro-electric power plant of the Southern Power Company at Great Falls, S. C., is to be greatly enlarged. This will enable the power company to furnish a greater supply of current to the textile mills in that vicinity.

The Avondale Mills, at Sylacauga, Ala., have begun the publication of a newspaper "The Mignon News" for the benefit of their employees.

Official announcement has been made that the Franklin Process Co., of Providence, will establish a large dyeing plant in Greenville, S. C., which will be in operation in about five months. The company for this plant, it is reported, will be capitalized at $300,000, a large part of which is being subscribed by Greenville people, and B. E. Geer, president and treasurer of the Judson Mills, is largely interested in the project.

An eight-acre site near the Mills Mill just outside the city limits of Greenville has been purchased at a cost of approximately $12,000, and a brick building to cost $100,000 will be erected thereon. The plant will be modeled after the Providence plant of the Franklin Process Company and Franklin process dyeing machines and Universal winding machines will be used. Lockwood, Greene & Company are the engineers for the building. At the start about 100 persons will be employed, it is announced, and this number will be gradually increased as the business and plant expands. The initial capacity of the plant will be 50,000 pounds of yarn daily.

The erection of a new cotton mill at Waxahachie, Texas, is practically assured. Options have been taken on a site of 25 acres on a railroad, at $250 an acre, and actual construction will probably begin soon on manufacturing buildings. The company to erect the plant is in process of organization. It is proposed to erect a plant of 15,000 spindles and 500 looms.

The Tallapoosa (Ga.) Mills announce that they have sold their interests in the Hutcheson Manufacturing Company, and that the latter company is now operating under its own charter as the Banning (Ga.) Cotton Mills.

The Liberty Cotton Mills, Dallas, Ga., have plans under consideration for the building of a new branch plant at Cameron, Ga.

Machinery has been installed at the new Union Cotton Mills, at Mt. Holly, N. C., which is one of the American Yarn & Processing Company's plants.

The Beaumont Manufacturing Co., Spartanburg, S. C., has awarded a contract for a number of improvements, including the erection of a machine shop, and repairs to Mill No. 1, representing an expenditure of practically $10,000.

Work on the department store building erected by the Ware Shoals (S. C.) Manufacturing Company in their village is about completed and fixtures are being installed.

The plant of the Icard Cordage Company, Icard, N. C., has been equipped to start production during the past month. One hundred 12-strand braiders and two 18-strand braiders were installed. Steam power will be used in the operation of the mill. George W. Hildebrand, of Icard, is president; M. C. Forbes, of Hickory, N. C., is vice-president; and S. S. Shuford, of Hickory, is secretary-treasurer.

Work will begin sometime during the fall months on the erection of the first plant of the Arkansas Cotton Mills Company, which now maintains head offices at Little Rock, Arkansas. The original plans of the company, which was incorporated last February with a capitalization of $3,000,000, call for the establishment of a chain of mills throughout the state of Arkansas with a central plant in Little Rock. The mill planned for Little Rock will employ about 500 persons producing such fabrics as sheetings, ducks and denims. The mills will, as far as possible, use the power to be developed from the hydro-electric power plant at Judsonia. Batesville, Helena, Fort Smith and Van Buren are other tentative selections as sites for other plants.

Construction work on the new Stonecutter Mills, at Rutherfordton, N. C., is progressing and the buildings will soon be completed. It is expected to have the machinery in and the mills running sometime during the fall months.

The Jackson Cotton Mills, Monroe, N. C., has changed its name to the Union Cotton Mills Company. L. O. Bunton, formerly of Charlotte, N. C., is superintendent.

The Eastman (Ga.) Cotton Mills plan the immediate construction of a 100-foot one-story addition, it has been announced by the president, C. H. Peacock. The addition will provide for about 4,000 more spindles.

Operations began recently at the Lone Star Cotton Mills, at San Antonio, Texas, which took over a portion of the plant of the old Lone Star Brewery of the Busch interests, of St. Louis, who are also interested in the new textile project. This mill has 250,000 square feet of floor space devoted to cotton manufacturing. It is equipped with 375 automatic looms, and a total of 10,000 spindles and has a daily capacity of 20,000 yards of blue chambray. The operative force numbers 150, composed mostly of Mexicans.

Contract for a new motion picture theatre has been let by the Republic Cotton Mills, Great Falls, S. C., to Potter & Shackleford, of Greenville, S. C.

A new dam has just been finished by the Chesterfield Manufacturing Company, Petersburg, Va., which will furnish power for the mill. The dam is two and one-half miles from the plant.

Three new mills have been chartered for Kings Mountain, N. C. They are the Patricia Mills, Inc., the Pauline Mills, Inc., and the Margoe Mills, Inc. The incorporators are C. E. Neisler, Sr., C. E. Neisler, Jr., and P. M. Neisler, of Kings Mountain These mills are capitalized at $50,000, $200,000 and $300,000, respectively.

Additions to the Boger and Crawford Spinning Mill, Lincolnton, N. C., are being made and new machinery is being installed which will double the capacity of the plant. This additional equipment includes 6,000 new spindles, giving the plant, when completed, a total of 12,000 spindles. Twenty-four new cards will be added, giving a total of about 40, also nine new combers. It is expected to have the additional equipment in operation by December 1st.

The New England Mill Situation.

Mill conditions have improved considerably in New England during the past four weeks. More machinery is in operation, operatives are giving a better type of service, and orders have increased to an extent that warrants hope of less curtailment during the fall and winter. Much is yet to be accomplished before production is of capacity volume or profits well assured.

The basis of the improvement has been the larger consumption of the staple household and dress materials this year since prices were cut so severely in the spring. Cotton goods have appeared cheap in relation to other textiles and consumers have bought and used them more freely than for several years past. This is shown in several ways, but notably by the large piece goods business done by jobbers and retailers, and by the many garments of cotton worn in all circles all over the country. So long as the ratio of low price favors cotton goods as against silks, wool goods, linens, and other things, the hope prevails among New England manufacturers that the industry will continue to show gains in the movement in all channels.

Most of the leading manufacturers have been convinced for some weeks that cotton is not going to be as cheap as many speculators and others have been predicting. The government cotton report, showing a crop estimate of only 8,200,000 bales, contrasting with 13,300,000 last year, and only 19,250,000 bales for the world's production last year, is frequently referred to as containing the seeds of many mistakes in judgment as the recovery in world conditions goes on. Contrary to many opinions current, the manufacturers of longer experience think that means will be found to finance the growing crop readily enough, while the difficulties of securing selected staples may maintain a substantial premium throughout the season.

The progress that has been made thus far in re-opening export markets is also looked upon as a factor of very large importance for the future. If prices here are not driven up too rapidly, and manufacturers profit from the lessons of the war period in catering to foreign markets, it is thought that a substantial percentage of the capacity production of the mills can be sold abroad, and thus take up any slack in the demand at home. One of the things learned during the war period was that foreign markets, carefully looked after, may be a source of as satisfactory profit over a term of years, as the erratic home market. Much will depend upon the willingness of the manufacturers to go on taking a small profit abroad, for a time, while the margin of profit at home seems more inviting.

A marked improvement has occurred in the colored goods situation. The gingham mills, of course, are fully sold up and will be kept busy for a long time. The Amoskeag Company of Manchester, N. H., the largest producer, has been employing more operatives of late than at any time in years, and this promises to continue throughout the winter. The American Printing Co., at Fall River, another large unit, has been more active this summer than ever before and in some departments has been running overtime. The Pacific print works, the large Arnold works, the Algonquin, and the Windsor print works, have been running to capacity, percales being the largest single line produced. The percale business has been very large.

The job finishers have not done as well in their printing plants as the large corporation printers. The converters have been timid about trying to compete and the business has gone to the larger works. The bleachers have been fairly busy although about the beginning of the month there was some slacking off. Fast black dyeing works have done better than the piece dye works. About the middle of August the converters of fine goods began buying more freely in the gray goods markets and it looks now as if this division has passed the worst of the long seige of limited business.

Any box looms available for fine yarn work have long since been placed under order on tissues, both plain and fancies. These goods are the best selling wash fabrics for spring at this time. There has been some improvement in the demand for fine hard twist voiles, which were slow for months. The fancy voiles of novelty descriptions in yarn dyed effects, have been selling much better during the past month. There has been a good business done in the very fine grades of linens and lawns, and some of the mills making the finest qualities of batistes have taken all the work they can handle till November. The finer grades of fancy shirtings are now in better call. There is much yet to be done before trade is right on piques and skirting materials

generally. Recently there has been a renewed interest in silk and cotton fabrics.

Print cloths have sold well and Fall River mills have been lessening the volume of curtailment steadily. The sales of the past few weeks have equalled the production and many stock goods of odds in widths and constructions have been moved. Fall River has not been selling very far ahead, most of the trading having been in spots or nearby deliveries, rarely running more than ten weeks ahead. Prices have appreciated sufficiently to warrant mills in extending their working schedules and it is believed at this time that the improvement will continue moderately during September and October. Manufacturers in this center have been trying to prevent the acceptance of business showing a loss based upon costs computed on the day of sale and have made considerable headway in convincing buyers that curtailment is preferable to operations without profit.

The general trend of buying during the past month has shown very clearly that the long continued curtailment of production is finally beginning to tell on jobbing and retail stocks. The difficulties some buyers have found in securing spot goods were quite unlooked for and if the demand from the country shows any expansion it should be reflected quickly among the mills.

There has been no diminution in the demand for the better known brands of wide sheetings, pillow tubings, and sheets and pillow cases. Tickings have been selling well for the past two or three weeks and are now quoted on a basis of 18c for 8-oz. goods. The break in southern denim prices to a basis of 12½c for 2.20 indigoes, led to the closing of some New England denim mills. But in the largest group, a further reduction of 15 per cent in wages has been accepted by operatives and the mills have now resumed operations in full. The New England mills did not follow to the low price basis named by the southern mills and have only sold in limited volume.

Cloths for the shoe trade have shown a little improvement and there has just begun to be noticed an improvement in the demand for coutils, and other fine specialties in drills and close heavy weaves. But conditions in the automobile trade are still unsatisfactory so that the tire fabric, rubberizing, and upholstery fabrics trade has only felt a little of the force of the uplift in conditions in other directions. The sale yarn mills have been doing better for the past couple of weeks and have much to accumulate in the way of business before they will resume in full. The mills that make yarns for the men's wear and women's wear trade have been doing much better than the spinners serving the general manufacturing trades.

Staple bleached cottons have been quieter than percales and convertibles generally. The leading brands of muslins are under order for some weeks but the unbranded lines have been quiet. There has been an unusual demand for the higher counts of staple wide print cloths, the 4-yard 80x80s, having risen to 11½c while the 72x76s are at 9c. This latter number has been held back by the slow development of liquidation in the collar industry. The fine combed yarn bleached goods and the fine carded nainsook have sold better relatively than the coarser goods.

There has been some isolated cases of wage reductions in small centers where the absolute idleness of mills was forced by the competition of southern mills working on much lower wage scales. But the general tendency throughout New England in the matter of mill wages has been to hold steady on the basis of 22½ per cent reduction made last December, until it is certain that if further reductions are necessary in meeting competition, they shall be made only when a reasonable guarantee of steady work may be given. There has been a very material change in the attitude of workers toward the mills due to the idleness than has been noted in other lines of industry. It is possible now to get more cotton mill help and it is also possible to secure steadier work from them.

The high municipal taxation, supplemented by the high state taxation, has become a very serious matter for manufacturers throughout New England, especially in the larger centers. Some of them are proposing to contest recent assessments on the ground of being excessive and not warranted by any reasonable basis of values of plants.

Cotton mill machinery plants have been running indifferently throughout the summer. It has been difficult to deal with the unionized help among the machinists and foundrymen, and some concerns have preferred to close or run short time rather than go on producing at a loss or at prices mill investors will not pay at this time. It is believed that there will be plenty of work to be done whenever prices can be made more attractive for machinery that is wanted for replacements and for new concerns.

That profits have been elusive for some time has been shown by recent mill reports. Some corporations are maintaining their dividends from reserves and will continue to do so for another six months, but their financial statements indicate that the past six months has been the hardest of any for the past five years. Mill stock values have been steadily declining and some are most attractive compared with any quotations reported since 1916.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, August 16th, 1921.

The market appears to be in a healthy condition, present and prospective, with indications of working higher, perhaps much higher eventually.

Contrary to general expectations the world's consumption of American cotton during the season of deflation was larger than looked for—10,500,000 bales vs. 12,760,000 in the previous season, reducing the world's carry-over of American cotton at the close of July to smaller proportions than generally anticipated—9,194,000 against 6,216,000 last year.

Exports from the U. S. the past season picked up sharply as the year drew to a close, figuring only 727,000 less than for the season of year before last—5,639,000 against 6,366,000.

CONSUMPTION OF AMERICAN COTTON BY GEOGRAPHICAL DIVISIONS.

Season	1920-21	1919-20
United States—North	2,086,000	2,660,000
United States—South	3,097,000	3,691,000
Foreign	5,317,000	6,319,000
Total consumed by world...	10,500,000	12,670,000

Of last year's crop of nearly 14,000,000 bales, only 11,377,000 bales were marketed. The average price of

middling last season was 16.08, season before last, 38.21; value per bale of crop marketed was $82.67, season before last, $174.58, and the value of the commercial crop shrunk to $940,537,360 compared with $2,172,324,368 in previous season.

However, the outlook for this season is more encouraging, as in addition to the small crop now in the making, the South was holding in the interior at the close of July 2,-282,000 bales more than she was holding on corresponding date one year ago—4,690,000 against 2,408,000. Moreover, the southern states were blessed with abundant crops, except cotton, this year on an increased acreage, which was at the expense of cotton, which serves them in good stead to hold their short crop of cotton this year for higher prices. In that connection pooling of interests has started already.

CARRY-OVER, JULY 31ST.

American Cotton—Bales	This Yr.	Last Yr.
Southern mill stocks	525,000	700,000
Counted interior town stocks	977,000	705,000
Uncounted interior towns & plan.	3,713,000	1,703,000
Total held in cotton belt	5,215,000	3,108,000
United States port stocks	1,335,000	756,000
Northern mill stocks	489,000	584,000
European mill stocks	460,000	475,000
European port stocks	1,695,000	1,293,000
Total	9,194 000	6,216,000
Lint cotton carried over	8,529,000	5,216,000
Linters carried over	665,000	1,000,000
Total	9,194,000	6,216,000

While the amount carried over appears large, the indicated crop is very small, about 5,000,000 bales smaller than last year, the government's forecast of August 1st pointing to a yield of only 8,203,000 bales vs. 13,365,000 last year, or about 5,000,000 bales less than one year ago.

In other words, while the carry-over was about 3,000,-000 larger than last year, the indicated crop of this year is about 5,000,000 bales smaller, and as consumption is likely to be about 2,000,000 bales larger this season than it was last season, there is the probability of the carry-over at the close of July, 1922, being reduced to about 5,-000,000 bales vs. 9,194,000 this year. As a matter of likelihood it is apt to be much smaller than 5,000,000, as the growing crop is reported as having deteriorated materially during this month, particularly in Texas.

The following, taken from the government report of August 1st will give an idea of the smallness of the indicated crop by states, compared with last year: Alabama, 443,000 bales vs. 663,000; Arizona, 50,000 vs. 104,000; Arkansas, 798,000 vs. 1,209,000; California, 40,000 vs. 75,000; Florida, 14,000 vs. 18,000; Georgia, 1,088,000 vs. 1,415,000; Louisiana, 279,000 vs. 387,000; Mississippi, 727,000 vs. 893,-000; Missouri, 49,000 vs. 77,000; North Carolina, 604,000 vs. 912,000; Oklahoma, 566,000 vs. 1,321,000; South Carolina, 857,000 vs. 1,610,000; Tennessee, 224,000 vs. 324,000; Texas, 2,443,000 vs. 4,326,000; Virginia, 15,000 vs. 20,000; all other states, 6,000 vs. 13,000.

An analysis of Hester's figures prepared by the Upton Seed Co., of Dallas, Texas, is of interest:

"Hester reports world's carry-over, American cotton		9,194,000
Of which linters	665,000	
Of which European stocks	2,155,000	
	2,820,000	2,820,000
Carry-over in U. S., Aug. 1, 1921 (excluding linters)		6,374,000
Of which American mill stocks are:		
Southern mills	525,000	
Northern mills	489,000	
	1,014,000	1,014,000
Carry-over available for export and American mills		5,260,000
Of which Snaps, Bollies and very low grades represent at least		1,000,000
Carry-over in U. S., good cotton		4,260,000

"(We should class 4,260,000 as carry-over spinnable cotton, but some may claim Snaps, Bollies, etc., as spinnable, so we class above as 'good cotton.')

"This 4,260,000 bales carry-over in the U. S. is what the trade must finally face.

"A look at the future:

"Mill stocks are at minimum, crop estimate is for 8,200,-000 bales (we do not believe final outturn will exceed 7,-250,000 bales after a torrid August is reflected in excessive shedding as result of a weak, sappy plant everywhere, or a rainy August encourages boll weevil to greater havoc.)

Concede 8,200,000 crop:		
U. S. carry-over as above		4,260,000
Crop 1921-1922		8,200,000
Of which U. S. consumption estimated for 1921-1922	5,500,000	
(U. S. Government reports indicate U. S. consumption 1921-1921, 4,-900,000.)		
Minimum requirements U. S. carry-over outside of mill stocks	750,000	
Available for exports 1921-1922	6,210,000	
		12,460,000

"Will 6,210,000 bales be sufficient for European requirements? Hester reports Europe consumed 1920-21, 5,317,-000 bales; during part of which time Japan was largely idle, China very active only recently, Germany being advanced credits today versus restrictions six months ago; Russia reported on verge of Bolshevik collapse, with her 150,000,000 people hungry for food and clothes. What if crop fulfills our prophesy and falls to 7,250,000 bales, reducing "available for exports" to 5,210,000 bales, with all the world bare of dry goods and all the world "turning the corner" to better business?

"The world has witnessed cotton declining from 43 cents to 12 cents in a year; is there a reverse surprise in store? Last year 'twas said cotton could not decline below cost of production; this year 'tis said cotton cannot advance until the South has sold its surplus stock. We hold there is no surplus stock in the light of the government report and that the world faces a deficiency instead of a surplus."

The Design and Manufacture of Fustians

BY T. WOODHOUSE AND A. BRAND.

The cloths known to those connected with the textile industry as velveteens, corduroys, swansdowns, etc., are members of a well-defined group of cotton fabrics generally termed fustians. The name of fustian is supposed to be derived from Fustat, i. e., Cairo, where, it is stated, these interesting textures were first manufactured. Other members of the group include cantoons or diagonals, imperial sateens, beaverteens and moleskins.

All of the above, with the possible exception of the cheaper makes of velveteen, are closely woven, compact, heavy cloths, possessing either a nap or pile which is the characteristic feature of such textures. Practically every variety of these fabrics is used for different kinds of garments, and particularly for dresses, coats and other kinds of outer apparel. The fabrics are also utilized as a covering for furniture, and employed as medium and heavy types of hangings. Velveteen fabrics possess at least one special feature of interest, inasmuch as they are cotton filling pile fabrics made to imitate real velvet, the latter being made from silk and having a pile surface made from the warp threads. The latter fabrics, in general, require for their production a so-called wiring-motion working in conjunction with the picking motion. The velvets or plushes made on the double-plush principle of weaving are, however, provided with warp-pile surfaces without the employment of the above-mentioned wiring-motion. The elimination of such motions simplifies the operation of weaving and generally reduces the cost of production.

The varieties included in the swansdown, cantoon and imperial groups are all produced by comparatively simple weaves. The weaves, however, although simple in nature, are all of a type which permits and facilitates the insertion of a large number of picks or shots per inch. For example, a moleskin fabric of a good quality may be as many as 400 picks of filling per inch, while the warp for the same cloth may contain only about 40 threads per inch. In exceptional cases 600 picks per inch may be introduced into certain types of weft-pile fabrics in order to obtain a fine and dense field of tufts. This large number of picks produces a smooth, compact texture, the surface of which, as already indicated, is composed entirely of filling. The filling is a comparatively heavy soft-twisted single yarn, while the warp, in order to successfully withstand the stresses and strains of shedding and beating-up, is commonly a 3-ply twist yarn. The moleskin mentioned, for instance, might have 14s cotton filling and 3/24s cotton warp. The characteristic nap is produced by a finishing process which raises slightly the pile.

The other varieties of fustian, including velveteens, corduroys, moleskins and beaverteens, may be regarded—from the point of view of weave structure—as special types of weft-backed fabrics in which, as usual, there are two series of filling yarns and one series of warp yarns. One set of filling yarn forms the face of the fabric, and the other set interweaves in some simple manner with the warp threads to form the foundation or ground of the structure. Both sets of filling, however, are generally of the same material, so that the cloths can be produced in the loom without the aid of a multiple-box motion; hence, there is only one shuttle, carrying one kind of weft, to be controlled during the operation of weaving.

Corduroys and velveteens are distinguished from all other varieties of fustian—which are smooth-faced textures—by the production on their upper surfaces of a short and soft pile or fur, closely resembling that of certain warp silk plushes or velvets. In general, however, the plushes and velvets are distinguished by longer piles or tufts than the fabrics under consideration. Again, the weaves employed for the production of corduroys and velveteens are comparatively simple, but capable of producing long floats of filling on the upper surface. These long floats are ultimately cut at or near their centers by the process known as "fustian cutting" which process may be done either by hand or by machine.

After the long floats of the fabric have been cut, the severed ends assume a position approximately vertical to the surface of the cloth and produce a fur or pile more or less closely resembling that of true velvet. In velveteens the pile produced is uniformly distributed over the whole of the upper surface, but in corduroys—Corde du Roi or King's cord—the pile is caused, due to the weave structure and to the cutting process, to develop in rows or lines (termed races) parallel to the warp threads, thus giving the characteristic ribbed or corded effect.

It is possible by special means to give to velveteens a corded appearance somewhat similar to that which is characteristic of corduroys; indeed the two kinds are so similar that they can scarcely be distinguished from each other except by their structures.

The operation of fustian cutting is almost invariably conducted quite independently of the weaving trade and as a special and separate branch of the manufacture of fustians. Both manual and mechanical means are employed, both of which shall be discussed later; the former is used generally for the better qualities, the low qualities being usually cut by machinery.

As velveteens and corduroys are closely related to one another in structure, and in appearance—particularly when the velveteen is of the hollow-cut variety—it may be advantageous to present a brief description of the method of producing velveteens before proceeding with the discussion of corduroys proper.

Velveteen textures are generally of a lighter weight than the other varieties of fustian mentioned, but it is quite possible that a heavy velveteen may be actually heavier than a light make of corduroy. If the velveteen be of the ribbed or hollow-cut variety, it will, as a rule be impossible to distinguish between them easily, unless a comparison is based on a knowledge of the particular structures.

In its most simple form, the velveteen fabric consists of an ordinary plain, tabby, or calico foundation carrying an extremely large number of U-shaped tufts of weft projecting from the interwoven groundwork, and uniformly distributed over its upper surface or face. The appearance of these tufts of filling, after the fustian cutting operation, is very similar to that illustrated diagrammatically at A, Fig. 1. It is simply a short piece of filling bent, as it were, partially round a warp thread.

The compound structure of the velveteen fabric is such that all the tufts could be withdrawn from the body of the fabric and still leave behind a comparatively firm texture of plain cloth. It is not to be inferred from this statement that plain weave is the only weave used for the groundwork of this type of cloth. On the contrary, medium weight velveteens are usually based on a 3-leaf twill ground weave, heavier makes have often a 2 up 2 down twill weave ground, and plain weave is used extensively for lighter qualities.

In any case, whatever weave happens to be employed, it is essential that the tufts of pile be so securely bound

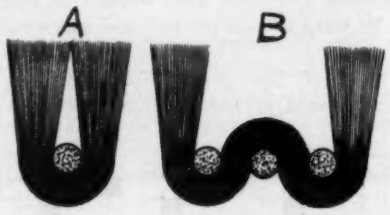


FIGURE 1.

or fixed in the body of the fabric that their withdrawal, either by accident or design, is rendered difficult. This desideratum may be fulfilled in at least three ways.

1. By inserting a large number of picks per inch. In this case the tufts, although formed as at A, Fig. 1, are held securely in position by compression; this is caused by the dense crowding of the filling picks.
2. By causing each pile pick to interweave with a number of successive warp threads. This structure, a diagrammatic representation of one type of which is illustrated at B, Fig. 1, is technically known as a "fast" or "lashed" pile. The fastness or security increases when the pile filling is made to interlace. The tuft at B, Fig. 1, obviously interweaves with three warp threads.
3. By combining the two methods just described. This third way results in a high degree of security, and is naturally only employed for the finest fabrics where the highest quality is essential. As a matter of fact, the extra interweaving of the pile filling with the warp threads necessitates, as a rule, a well-covered surface which, as indicated, is invariably obtained by a large number of picks per inch.

In general, however, the great majority of velveteen fabrics have the pile picks bound into the foundation fabric by only one warp thread, e. g., say, every 4th, 6th, 8th or 10th thread according to the sett of the warp and the length of pile it is desired to produce. Whatever method or order of stitching the pile filling to the foundation texture is adopted, it is imperative that the binding points should be situated at perfectly regular intervals throughout the cloth, in order to secure uniform floats of pile filling, a consequent uniform length of pile, and, as a rule, a surface which is free from lined effects.

It will be understood, of course, that the cloth presents no unusual appearance as seen in the loom, being to all intents and purposes a simple weft-faced fabric. It is the subsequent independent operation of fustian cutting that gives the cloth its characteristic pile surface and appearance—an effect which will be illustrated later.

In making such weaves as are used for velveteens and corduroys on point paper it is well to remember that marks may be taken to represent either warp on surface or filling on surface. In the former case, marks rise, and in the latter, marks fall. In the weaves and designs used to illustrate this article, marks will be taken to rise, i. e., to indicate warp threads on the surface of the cloth, as this system results in economy of labor in the preparation of the weaves and designs. On the other hand, the "marks fall" system will be used occasionally, since in these cases the weaves employed result in the major portion of the filling coming to the surface. Designs made on the latter system are sometimes more easily understood, particularly by those who are not completely accustomed to the use of design paper. Marks are therefore to be regarded as indicating warp on the surface unless the contrary is expressly stated.

The design at A, Fig. 2, shows one unit or so-called repeat of a simple velveteen weave complete on 6 threads and 6 picks. The pile picks are marked in solid squares, and the ground picks are marked in circles. The relative proportion or ratio of pile picks to ground picks is 2 to 1. Each of the orders of interlacing used is shown respectively and separately at B and C; the former is the ground or foundation weave, and the latter the pile weave. It will be observed that the ground filling weaves plain (tabby or calico) with all the warp threads throughout the cloth. The pile picks and the warp threads do not form a complete weave in themselves. The marks at C, Fig. 2, may be regarded as two picks of the 1 up 5 down weft flush twill

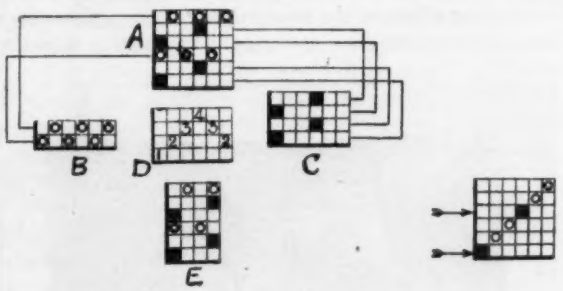


FIGURE 2. FIG. 3.

to right, a complete unit of which weave is given in Fig. 3 for the sake of ready comparison; the particular picks used are marked in solid and also indicated by arrow-heads. Returning to Fig. 2, the marks in these pile picks really indicate the places in each repeat of the weave at which the pile filling interweaves with the warp, i. e., the points at which the filling is bound into the plain foundation fabric.

It will be found from an inspection of the unit weave that there are only 4 different orders or kinds of threads, and that the weave could, in consequence, be produced with 4 harnesses and 6 picks to the round. If the threads were drawn through the 4 harnesses in the order indicated at D, Fig. 2, the corresponding weaving plan would be that marked E in the same figure.

Although we have reduced the design A, Fig. 2, to its lowest possible number of harnesses, viz., 4, it is quite possible that, unless there was a considerable order to be executed of this particular type of cloth, the weaving would be done on 6 harnesses with a straight draft. This arrangement would enable the 3-harness ground weave to be made without having to re-draw the threads of the warp, provided that the sett and the count of the warp yarn were suitable.

As the surface of the fabric is practically compo ed

wholly of filling, perhaps a better idea of the structure may be obtained from illustration F, Fig. 4, which shows four repeats or units of exactly the same weave as that given at A, Fig. 2, but in which marks fall, i. e., marks represent filling on the upper surface of the cloth. In the particular instance shown, the filling nominally predominates over

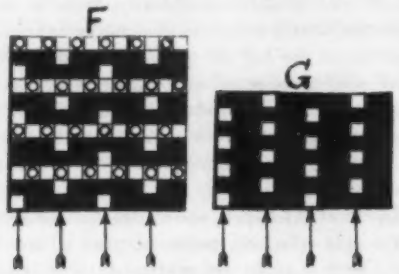


FIGURE 4.

warp on the surface, with respect to the weave, in the proportion of 13 to 5. The actual ratio, however, is higher, and at least 5 to 1, since the long, and therefore comparatively loose, floats of filling obscure the ground weave, and, besides, each pile shot slides over the binding point of the preceding pick, and thus produces an effect more or less like the diagrammatic view at G, Fig. 4, which is obviously a graphical representation of the pile filling only in the 4 repeats of the weave shown at F.

The net effect of the weave is to develop a foundation cloth of perfectly plain structure, into which is bound or

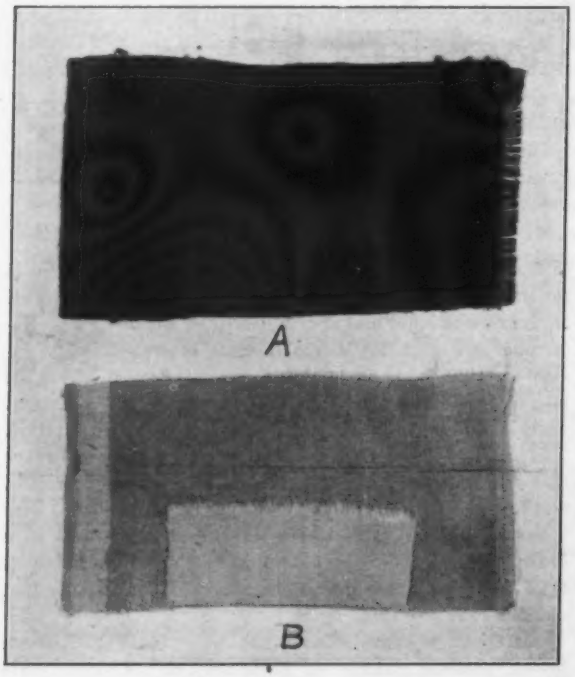


FIGURE 5.

stitched, at regular intervals, the floats of the pile picks These floats form longitudinal rows or courses, technically termed "races", lying on the surface of the foundation fabric. The actual races, however, are the *openings* between the under surface of the pile picks and the upper surface of the ground fabric; the center lines of their positions are indicated by the arrows immediately below the diagrams F and G, Fig. 4.

As stated, the floats of weft are severed, and the pile tufts formed, by the fustian cutter, by passing a special form of knife through the center of the above-mentioned races and at the points just stated, whereby each of the filling floats is cut into two parts. The general effect is then a solid pile surface, such as those represented by the patterns at A and B, Fig. 5. In both cases, a small portion of the sample has been turned over so that the difference between the plain back and the pile surface can be exhibited.

The upper pattern A contains 78 warp threads per inch and 62 ground picks per inch, whereas in the pattern B there are 84 warp threads per inch and 80 ground picks per inch.

The result of this operation of cutting is more convincingly indicated in Fig. 6, where four repeats of the

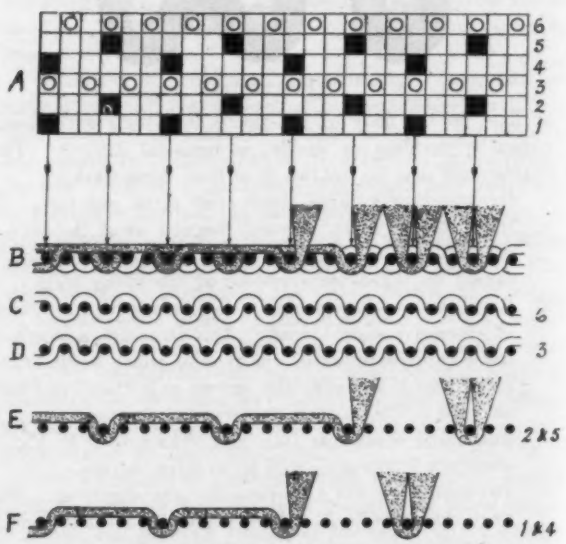


FIGURE 6.

unit weave appear at A in the upper part. The picks 1 to 6 are marked on the right hand. A transverse section is shown at B, the left-hand side indicating the structure of the fabric as it leaves the loom, and the right-hand side its appearance when the floats have been cut by the fustian cutter's knife.

The arrows, which depend from the weave A to the transverse section B, indicate the parts where the knife cuts the floats of filling. In each race, the knife cuts alternate floating picks, the remaining floating picks being cut in the adjoining race.

Intersections C, D, E and F represent all the warp threads interweaving respectively and separately with picks 6, 3, 2 and 5, 1 and 4, all of which are numbered on the right-hand side of the illustration. It will be observed that all the tufts in any row are identical in shape to that illustrated at A, Fig. 1.

Before the actual operation of cutting is commenced, it is customary to subject the woven fabric to a liming and starching process. The purpose of the former is to prevent "fuzziness" of the pile and to keep the knife edge sharp, while that of the starching process is to stiffen the fabric, to facilitate the cutting operation, and to prevent accidental

withdrawal of the pile tufts while the yarn is in contact with the knife.

After removal from the loom, and in the liming process, the cloth is passed over a roller which rotates in a trough containing slacked lime, and in such a manner that the pile filling or surface of the cloth is lightly coated with a thin lime paste. It is then immediately passed round steam-heated cylinders to be dried, after which the back of the fabric is similarly treated with flour paste.

(To be continued.)

Bureau Work Duplication at Washington.

In the July number, COTTON editorially called your attention to the investigation then being made by a joint committee of Congress on the overlapping and duplication of work by the bureaus at Washington. You were then asked to aid. In order to further emphasize the need for this reorganization a letter from Herbert Corey to the Atlanta Journal is being reprinted herewith. Because it is written in a semi-humorous vein is no index that it is not a serious matter to you as a taxpayer. A letter of commendation from you to Chairman Brown of the congressional committee will do no harm. It may do good.

Mr. Corey says:

"Here's the funny thing about a bureaucrat. He isn't intentionally selfish. It isn't the pay envelope so much as the work that interests him. He firmly believes that whoever seeks to mess up his organization is profaning holy places and tearing the foundation stones out from under the republic.

"That is why the congressional committee on reorganization is finding so many rocks in its pathway. The rocks may not amount to anything in the end. They may not impede the progress of the reorganization car. But they are indubitably there. Every bureaucrat in Washington, which is a town completely filled with bureaucrats, is shrieking in chorus with every other bureaucrat. The sound of their lamentations resounds from the monument to Glen Echo.

"Before considering the tortured bureaucrat let us first consider the job on the hands of the congressional committee, and more specifically on the hands of Walter F. Brown, the Toledo man selected by President Harding to be the chairman of that committee and the link between the legislative and the executive departments. On the wall in front of Mr. Brown's desk, where he must see it whenever he lifts his eyes, is a large chart.

"It shows that there are twenty-three governmental activities which are more or less common to all the governmental departments. Some have a small share, it is true. A governmental activity may be personified as a detective, for example: It is the detective's duty to run down evildoers. It would seem that when a detective is not engaged in chasing counterfeiters he might as well be intrusted with the duty of catching yeggs who tear into country postoffices.

"But he isn't. A treasury detective is a treasury detective. Only that and nothing more. If he saw a yegg breaking into a postoffice safe, it is doubtful whether he would interfere. But if that unfortunate criminal were to pass a bad twenty, the officer of the law, hard-eyed and unrelenting, would follow him to his last choking gasp.

"Likewise a postoffice detective might not worry himself over the nefarious operations of a counterfeiter, though he saw the money changed. But give him a sniff of the nitro smoke that curled from a broken postoffice safe and he would die in his tracks before giving up the pursuit.

"Now, there are nine different departments of the government which operate detective forces, not to speak of the army and navy, which have uniformed forces of their own engaged in an entirely different line of work. Likewise one would think that a good map-maker might make a good map for his employer, whether that employer be the coast or geodetic survey, or the fisheries bureau. That just shows you how far you are wrong. It can't be done. A naval map-maker feels that he would be shamed and degraded if he were called on to make a railroad map for the department of commerce. Yet—touch any map-maker and you have touched all map-makers. The suggestion that a map-making bureau be created in which all governmental maps shall be made has resulted in heavy congregation moans.

"The twenty-three different governmental activities discoverable upon Mr. Brown's chart criss-cross each other at 364 places. There are that many duplications of activity. There is a bureau of chemistry, for example, which has a perfectly corking chemical laboratory in which the latest things in smells and explosions are produced under rigidly sanitary conditions. So has the bureau of standards. The outsider—the man not familiar with the devotion of the average bureaucrat to his job—might hastily imagine that one chemical laboratory would do for the two. Not so the bureau of standards and the bureau of chemistry. The employees of the two bureaus, from the chiefs down to the wheelbarrow experts, feel very deeply that the progress of science would be unjustifiably halted if any such consolidation were effected.

"Yet, just that must be done if the proposed reorganization is put into effect. After months of examination, Mr. Brown placed before President Harding and his cabinet a statement of conditions as they are now. It appears that at present the work of the government departments and bureaus and the like may be grouped under the head of 'subject-matters.'

"A fish is a subject-matter. The fisheries bureau has sole charge of fishes. It follows the fish from the cradle to the grave. It watches tenderly over his birth, it surrounds him with clean water of just the right temperature, and when he gets old enough it translates him to other waters where his domestic activities will be welcomed. He is protected by the bureau. In time he becomes an article of commerce, and the bureau prescribes the manner in which he may be caught, discovers methods by which he may be canned, and superintends his dispatch toward the distant market.

"The plan has been fine for the bureau and all right for the fish, but it has not been a forward step toward governmental efficiency. For other bureaus have been engaged upon similar labors side by side with the fisheries people. The biological survey is charged with the general duty—as the non-scientific mind sees it—of promoting and reporting upon all births, from ragweed to Noah Websters. Another department has coincidental authority over the waters and another over transportation and another over commerce. So that Mr. Brown proposed, and the proposition has been accepted by President Harding and his cabinet,

that the 'functional' plan of co-ordinating governmental activities be decided on.

"Functional! Get the word. Stick a pin in it. Look it up in the dictionary, for the time will come when you will hear much of it. The fundamental plan of operation is that upon which all great business organizations are conducted. You would not expect the man who makes the Crimson Hero automobile to follow that redoubtable car from the mine to the service station. When he gets through making the car his job is at an end. One man provides the raw materials and another superintends the manufacture and another the selling. Each has his function. No one gets his function messed up with any other man's function. The organization runs on well-oiled wheels. But the moment it was suggested to apply this same plan to the operations of the government the allied bureaucrats went into action, platoon front.

"Most of us have thought—do think—that a bureaucrat is a wooden person who is addicted to an easy job on the government payroll. Doubtless there are many such. Likewise there are probably many bureaucrats who foresee a certain loss of job in the proposed reorganization. But the fact seems to be that the bureaucrats have been maligned and misunderstood as a class.

"Most of them are on the job because their hearts are in it. The man who came into the service years ago as the clerk in charge of the kindling wood subsection and by unremitting toil has built that section up until he maps and plots the forests in which kindling wood may be found, and knows that kindling wood, may only be cut in the dark of the moon, and prescribes the manner in which it shall be bundled and tagged, feels that he has rendered a great service to the public. In most cases he has. What he is violently failing to see is that the purveying of kindling wood to the masses may be divided among various function-holding officials. One man may well rule all the forest and another all the railroads. But when four or five each have a crack at the forests and four or five others likewise have a crack at transportation, and still others at marketing and axe grinding, and fire building the thing becomes unduly complicated.

"Yet every bureau chief and subhead in Washington has been engaged in following his particular fish from its first conscious moment to the corner grocery. He has lived fish, talked fish, loved fish. The suggestion that any other man in the government employ might be as competent as he to handle that fish at any stage of its progress either hurts or angers him. How could any man properly smoke a fish who has not been, so to say, a cousin to that fish during its years of growth? They have been so absorbed in their work that they have ceased to consider the government. They are the devotees of their bureau, the dervishes of their desks. They are perfectly willing to let this new idea of 'functioning' apply to all the other unimportant and negligible departments and bureaus. Heaven forbid that they should lift a finger to impede so praiseworthy a reform. But—when it comes to the particular and personal fish—hands off!

"Hence the chain letter plan of resistance. In every political capital there is but one way known of accomplishing anything. That is by the application of political pressure. It always has worked. Therefore it should always work. Every bureau chief who sees, as he thinks, his life's work destroyed because a part of his job is to be taken from him and given to some one else, while in turn he is given that part of some one else's job he is most fitted to handle, has written to the people with whom he has been chiefly in contact. He has urged them to write letters to the reorganization committee demanding that sacrilegious hands be taken from his sacred fish. It has added materially to Postmaster-General Will Hays' job. Letters of protest pour in every day.

"Letters are oddly alike. They are couched in almost the same language and carry almost the same arguments. Each argument is the one written by the particular bureau chief who has seen his particular bureau endangered by this onthrust of modern methods. They do not seem to have done any particular good or any particular harm. The reorganization committee is going stolidly on its way. In the end it is entirely probable that the 'functional' plan will triumph, and the government departments will begin to operate in a businesslike way.

"Pity the bureaucrats! Their hearts are breaking."

Textile Products Show.

Following the return of W. G. Sirrine, president of the Textile Products Show, which is to be held in Greenville, S. C., at Textile Hall, from October 6 to12, and Milton G. Smith, chairman of the exhibitors' committee, from a trip to the North in the interest of the show, announcement was made of a partial list of the exhibitors. It was stated by Mr. Sirrine that the officials were not at liberty to announce names of exhibitors until contracts are actually signed, and for this reason the partial list only is given. In addition to the names of exhibitors given out, said Mr. Sirrine, there will be scores of exhibitors from among the mills of the South, from garment manufacturers in Baltimore, New York and elsewhere and exhibitors of various articles made from cotton cloth.

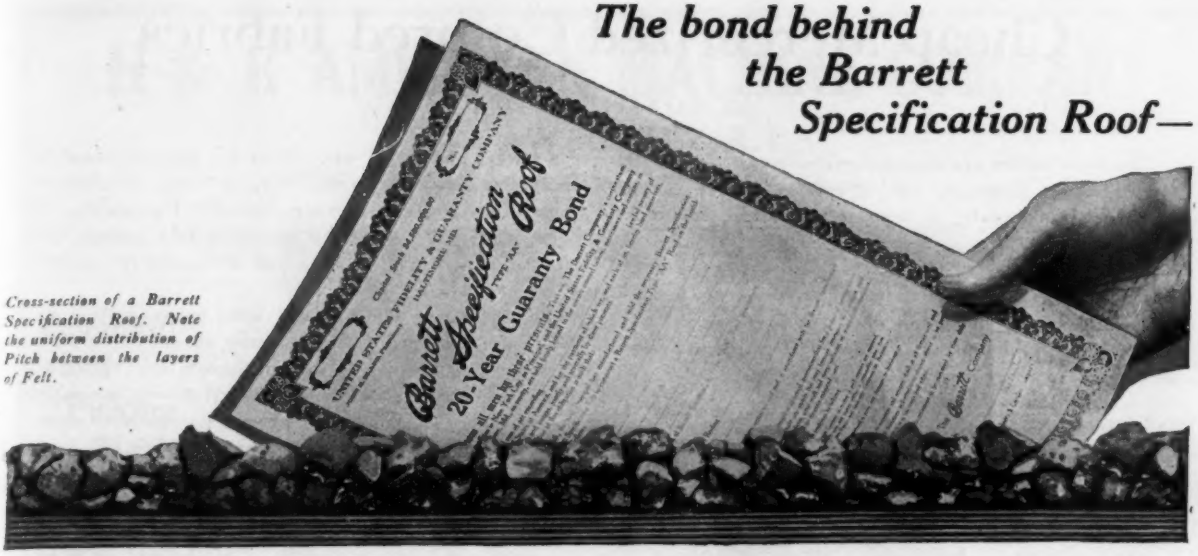
The partial list of exhibitors for the show, as announced by Mr. Sirrine, is as follows:

American Printing Company, Ridley Watts & Co., Hunter Manufacturing & Commission Co., Aberfoyle Manufacturing Co., Deering-Milliken Co., Franklin Process Co., Lawrence & Co., Woodside Cotton Mills Co., Utility Manufacturing Co., Pacific Mills, Judson Mills, Camperdown Mills, Pelzer Manufacturing Co., and the Victor-Monaghan Mills.

This list in itself, Mr. Sirrine declared, would insure the success of the show.

S. A. Woods Machine Company, Boston, Mass., have issued a bulletin on their squirrel cage, polyphase, double rated, semi-enclosed motors with 40 per cent rating, which deals with the subject of induction motors for general purposes. Also sent with the folder is an insert showing the outline dimensions of Type S induction motors. These semi-enclosed motors are so constructed that all incoming ventilating air passes through screens which exclude dust, and the company states that their polyphase induction motors possess features in design and construction whereby any accidental oil or moisture-soaked dust cannot enter and accumulate within the motor; no air enters over the bearing housings, it is pointed out, hence oil accidentally spilled in filling is not drawn into the motor. These motors are adapted to service in textile mills and under practically all other conditions except those demanding a totally enclosed equipment.

The bond behind the Barrett Specification Roof—



Cross-section of a Barrett Specification Roof. Note the uniform distribution of Pitch between the layers of Felt.

EVERYONE admits that a bond issued by The United States Fidelity & Guaranty Company is surer protection against roof repair expense than any guarantee.

"But," the owners and architects sometimes say, I don't care so much about the cost of repairs. What I want to avoid is leaks—and even your Surety Company Bond can't keep the roof from leaking."

They're wrong! The bond does keep the roof from leaking. For the bond behind The Barrett Specification Roof is more than insurance against maintenance expense—

It is positive proof that the roof was laid by a roofing contractor who has earned a reputation for honest, dependable work. For only such roofers are permitted to lay Barrett Specification Bonded Roofs.

It is positive proof that a Barrett Inspector was present on the job—present to see that the highest grade pitch and felt were used in quantities sufficient to give maximum strength and durability—present to see that the heavy top coat of pitch was *poured* and in it the gravel or slag surface was properly imbedded to insure as high a degree of fire protection as any roof can possibly provide.

Barrett Specification Roofs take the base rate of fire insurance.

When a roof is built by a reliable roofer, and in strict conformance with The Barrett Specification, it is practically impossible for leaks or other roof troubles to develop until long after the expiration of the 20 or 10 year bonded period.

This is why The Barrett Specification Bonded Roof *costs less per year of service* than any other kind of flat roof.

Full details regarding these bonded roofs and copies of The Barrett Specification sent free on request.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh Detroit New Orleans Birmingham Kansas City Minneapolis Dallas Nashville Syracuse Seattle Peoria Atlanta Duluth Salt Lake City Bangor Washington Johnstown Lebanon Youngstown Milwaukee Toledo Columbus Richmond Latrobe Bethlehem Elizabeth Buffalo Baltimore Omaha Houston Denver Jacksonville

THE BARRETT COMPANY, Limited:
Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Barrett Specification Roofs

Bonded for 20 and 10 Years

Cheap Mercerized Colored Fabrics

BY RAFFAELE SANSONE.

The manufacture of cheap mercerized goods has recently received much attention, and is carried out in modern works quite differently to what it was fifteen or twenty years ago. The strong competition to which these goods are subjected on every market, and in all times, as well as the high price of labor, render it very difficult to produce colors cheap enough to find sale, and new methods of manufacture, or modifications of older ones, have been introduced, in which labor is reduced as much as possible, and every advantage is taken of the most recent mechanical, chemical and electrical improvements and applications.

This has given encouragement to machinery makers and engineers who have spared no effort to improve the equipment for rendering cheaper the maintenance of the pieces of cotton cloth. Older machines have been subjected to modification, and special new apparatus has been constructed where the goods can be worked continuously all the way through. For this reason there are now plants in use on which the cloth is run rapidly from the boiling out kiers through the mercerizing range to the dyehouse and here through a dyebath, without necessitating any of the handling once so necessary, and which is still practiced in some works. In such plants much attention is given to the distribution of the machinery, which is placed in such order as to permit no waste of time through distance or bad organization; thus the kier-room is side by side with the mercerizing department, so that the cloth, in rope form, can be discharged, through holes in the wall, directly from the kiers to the opening or stretching machine, and from this to the mercerizing range. The dyehouse is also near the mercerizing room and the cloth can be easily passed direct to the jigger in the wet state, by means of a well disposed service of wooden shells. The same shells, which have served during the dyeing, are again used for transporting the cloth on the drying machines in an adjoining room. The calender or finishing room is also near the drying room, and the dried cloth, in a well stretched state, can be at once finished with very little employment of labor. Other mechanical improvements have been made in the chemical portion of the manufacturing process, which have cheapened greatly the boiling with carbonate of soda or lime, and in the mercerizing room the caustic soda used for the impregnation of the cotton cloth, and at one time thrown away, is now recovered with very little cost.

To give an idea of the perfection to which the mechanical treatment of the pieces has been brought, a special series of styles is produced in which the boiling out or malting process is left out completely, representing the cheapest form of mercerized goods so far known. In this instance the pieces are treated with the strong caustic soda baths in the grey state just as they arrive from the weaver and sizer, and on leaving the mercerizing range, are sufficiently free from size, or filling, to permit a uniform dyeing or finishing; the little size still contained, as a caustic soda modification, helping to impart to the goods a peculiar characteristic finish, especially required for some articles.

It must, however, be pointed out that this process only holds good for those works which manufacture their own cloth, or are in a position to procure goods containing up to a certain amount of size. These are better situated for this process than those who buy, or treat, the cloth of others, for they can regulate carefully the quality and quantity of size used in the manufacturing process, thus reducing the amount of waste and increasing the quantity of caustic soda recovered.

The mercerization of thickly sized goods, without any previous boiling or purging is quite out of the question, for they only thicken the washing liquors and vitiate any recovery; no amount of lime employed during the caustic process being then sufficient to liberate the recovered caustic soda, or to permit an economical mercerization.

Many works, therefore, still prefer to continue with the old but safe process of boiling out with carbonate of soda or lime, and it must be pointed out that if a perfect silk finish is desired, the goods must be as free of size as possible, for any size present only tends to diminish the luster and softness of the finished goods.

The recovery of the caustic soda used during mercerization is carried out by special plants, which yield very good results without requiring any special change in the mercerizing ranges, or without encumbering in any way the work; in fact, with a properly mounted plant, the pieces can be mercerized even more rapidly than formerly, for the washing is more thorough, and the washings containing the caustic soda can be easily liberated of the majority of the size, or of other impurities which find their way into the liquor, if, during the causticizing, a process carried out to bring to its original strength the caustic soda lye, an excess of good quick-lime be added with a few pounds of lead acetate.

This recovery of the caustic soda can be carried out so thoroughly, that practically very little caustic soda is lost, and this is due principally to dispersion, or leakage. The writer has sometimes had to causticize liquors which were quite black, and as thick as a syrup; these, however, after causticizing, strengthening and concentrating, could very well be used again and again for mercerizing.

It will be easily understood that by using the same caustic soda over and over again, with very little addition of carbonate of soda and lime, the cost of the mercerizing is considerably reduced, especially if it be borne in mind that with a properly worked recovery plant as much as 85 to 90 per cent of the original caustic soda can be easily recovered with very little cost.

Recovery plants underwent a certain number of changes before the war, and are still undergoing many improvements of considerable importance. An apparatus was introduced some time ago, by which the washing of the goods was rendered more thorough by treating them in continuous form with steam under pressure. The apparatus worked well, and the recovery of the washed out caustic soda was much increased and by sorting out the thicker cloths from those of finer texture, and regulating the speed of the range, excellent results were obtained. Unfortunately many condemned this apparatus, for, by allowing the range to run too quickly, they obtained brown streaks in all the length of the cloth, due only to a too short steaming and washing.

H & B AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

Southern Office Atlanta Trust Co. Bldg. Atlanta, Ga.

Opening and Picking Machinery

Card Room Machinery

Spinning Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

COTTON MACHINERY

Improvements were also applied in the mercerizing tenters themselves, where the stretching of the impregnated cloth was conducted with a longer chain for permitting a better washing and for reducing, by a more gradual stretching, the breakages of the borders; a common occurence with older small chain machines. Another important source of economy, brought about by the caustic soda recovering process, was the reduction in the acid necessary to neutralize the last traces of caustic soda, which even the best washed mercerized cloths always contains.

These improvements have not, however, closed off for the future the possibility of further transformations, and there is every indication that these will be introduced through the employment of electricity and electrolytical processes, that will allow the transformation of common salt into caustic soda, and the recovery of this last under better conditions than the present.

Cheap mercerized goods, as they come from the mercerizing room, where they have been treated without having received a preceding boiling out process, are generally dyed at once, avoiding altogether an intermediate drying, and sufficiently uniform shades are obtained in this case by a capable dyer. The colors generally employed for this class of goods are as follows:

For reds—Direct reds of scarlet and bordeaux, or claret, shades, using generally benzopurpurine 4B, benzopurpurine 6B, benzopurpurine 10B, congo reds, and other direct reds and scarlets, such as chlorantine red 4B, diamine brilliant scarlet S, benzo rhoduline red B, dianil red 4B, sultain 4B, titan scarlet S, dianol brilliant red X, benzo fast scarlet GG, direct safranine B, etc.

For pinks:—Blueish pinks, yellowish pinks, salmon pinks produced with erika BN, erica GN, brilliant geranine B, feranine G, benzo scarlet 5BS, titan scarlet S, benzo rhoduline red B, diamine rose BD, etc.

For blues:—Generally a sky blue as Chicago blue 6B, dianol blue 6B, diamine sky blue FF, chlorazol brilliant blue 8B, direct sky blue 6B, acetylene sky blue, titan como 2B, benzo sky blue, amidine blue, amidine sky blue, etc., and a duller or marine blue with such colors as dianil blue R, benzo azurine B, titan ingrain blue, titan blue 3B, titan blue 3R, chlorazol blue 3G, triazol blue, naphthamine blue 2G, diamineral blue R, diaminogene blue NB, diamine steel blue, etc.

For yellows:—An orange yellow such as chrysophenine G, benzo fast yellow 5GL, dianil yellow 3G, diamine yellow C, sultan yellow G, titan yellow R, direct yelow 1209, thiazol yellow, chloramine yellow N, cotton yellow CH, new turmerine, aurophenine I, and a lemon yellow produced with diphenyl yellow, titan yellow G, etc.

For oranges:—Bright and dull oranges produced with such colors as mikado orange 4RO, sun yellow G, titan orange, pyramine orange, etc.

For greens:—Olive greens, sage greens, pea greens, black greens, blue greens, etc., produced with such colors as direct greens, dianol greens, dianil greens, etc.

For violets:—Generally reddish violets, blueish violets, neutral violets, very dark violets, etc., produced with such colors as benzo violet R, dianol violet R, heliothrope BB, etc.

For browns:—Generally of greyish cast, reddish cast, neutral cast, yellowish cast, etc., and produced with such colors as diphenyl brown BN, naphthamine brown, dianil brown M, titan brown O, chlorazol brown R, zambesi brown

FACTORIES AND WAREHOUSES

RE-INFORCED CONCRETE CONSTRUCTION

ARTHUR TUFTS COMPANY

CONTRACTORS AND ENGINEERS

ATLANTA, GA. BALTIMORE, MD.

2G, columbia brown R, congo brown R, etc.

For blacks:—Sulphur blacks have already substituted in many works the direct blacks, once so largely used, owing to their greater facility of production everywhere, and their very good fastness.

Strange to say, very little change has been made in jigger dyeing, excepting that in the case of some colors, and especially blacks, the goods are submitted to a slight soaping on another jigger. In the case of sulphur blacks a similar soaping washes away the unfixed color, which if left on the fabric would form brown spots, which cannot be removed by any successive treatment, and should therefore never be left out. The black, thus dyed is, however, not a very good substitute for aniline black, and can be used for certain articles where the luster, touch or impermeability of aniline black are not required.

If it is wished to imitate, without great expense, exactly a market silk finished aniline black the following method will be found very useful in many cases: The mercerized fabrics, dyed in the sulphur black, are passed after having been well washed in running water, into a very weak one bath aniline black, containing an excess of bichromate of potash or soda. In this the goods are treated first cold, the bath being then gradually raised to the boil, at which it is kept until the wanted shade has been produced. An experienced dyer only can judge the best moment to stop his jigger, for too long a boiling is thoroughly useless in this instance, as the reaction on the fiber takes place rapidly, and any useless treatment only impairs the strength of the fabric and dulls the black.

This simple treatment suffices to convert the reddish hue of the sulphur black into a beautiful green black, and to give the cloth a much thicker and richer appearance, and the touch, or grip, of aniline black. Moreover the black assumes a splendid luster, which resembles very closely that of aniline black, and it becomes impermeable to such an extent that it is often considered much superior to them.

Another factor of great importance, which must be considered, is the strength of the dyed cloth, which is in no way reduced, thus permitting for the manufacture of these black goods of even superior strength.

The amount of the one bath aniline black used can be reduced to very low figures, providing the chrome present be kept constant at three per cent, for very little aniline salt is needed to form the black.

The reaction which in this process takes place between the dyed sulphur black and the one bath aniline black can be explained as follows:

The sulphur black, when deposited upon the cloth from the bath of reduction, containing the sodium sulphide, is oxidized by the air to form the black lake on the fiber; it, however, does not oxidize completely. The complete oxidation is brought about by the excess of bichrome, which produces a rather reddish or tarnished black, changed to a beautiful greenish black by the small amount of aniline black lake with which it appears to combine.

On Shreinering, without steam or hot water damping, the pieces treated as described yield a beautiful full silk finish, having a very agreeable grip or touch, and are not stained by water even after twenty-four hours steeping.

The black thus obtained can compete with any aniline black, and is, in fact, to be much preferred to this latter, as it does not necessitate any of the cumbersome and expensive aniline black plants, and any dyer can easily produce it on ordinary jiggers.

Any practical man who has once produced a black by this process will confirm that the cost of manufacture is very slightly above that of an ordinary sulphur black, for, owing to the very intensifying action of the aniline black, it is possible to reduce, after some practice, the amount of sulphur black used for the ground, thus compensating in part for the extra chroming process. Not more than the correct amount of one bath aniline black should be used, for an excess only tarnishes the black, which afterwards rubs awfully.

A precaution is, however, necessary before sending goods dyed in this way into the dyeing room, and this is to expel the last traces of acid left from the one bath aniline black treatment; that is accomplished by subjecting the pieces to a slight soaping. This not only acts as a neutralizer, but also enhances considerably the brilliance of the black, for a bright finish makes its appearance after Shreinering, which is probably due to the formation of a special combination between the soap, aniline black and sulphur black. Moreover, the soft feel of the old fashioned long process aniline black is very closely imitated in this way, and if all the proportions are carefully regulated, a marketable black costs very little more than any of the present sulphur blacks.

In the drying room very little change has been made; the chain drying machine is, however, slowly replacing its older competitor the cylinder drying machine, owing to the larger production and to the stretched condition in which the pieces are dried, which brings an advantage afterwards during the calendering.

On inspecting a modern calender room very little change is to be found, although in the past quite a series of transformations took place, and many modifications were tried on the different types of calenders. The hot Shreinering is carried out as before, and seems to still constitute the principal finish generally preferred. Special wetting apparatus are used in some works before Shreinering, the damp state of the cloth constituting, according to some, a means of producing a permanent finish; still even here, there is a great disillusion, for if the black is not impermeable from the start, no finish can be produced of strong resistance, and can soon be reduced.

With the establishment of close diplomatic and commercial relations between the United States and Venezuela an increase in the cotton production of the latter country is among the possibilities of the next few years. American capital would be welcomed in this field by the Venezuelan government, which is pursuing an extremely liberal policy toward foreigners.

It is estimated that at present Venezuela produces about 2,000,000 kilograms (4,400,000 lbs.) of seeded cotton. The yield per plant is said to be larger than in the United States. Cotton is sown, as a rule, in July, and gathering of the crop begins toward the end of November or at the beginning of December. The Venezuelan product is classified in the world markets as Cotton No. 2. Fifty-four per cent of the nation's crop comes from the states of Aragua and Carabobo, but the best quality cotton comes from the state of Zulia.

Notes About Men You Know.

VANCE MCCARTY.

VANCE MCCARTY, one of the most prominent men in the leather belting industry, has been elected vice-president of the Chicago Belting Company. He leaves the Edward R. Ladew Company, a subsidiary of the Graton & Knight Mfg. Co., where he was vice-president.

Mr. McCarty has been brought up in the leather belting industry, the first six of his twenty-two years experience in this field being spent in the various departments of the manufacturing end of the business. For the last sixteen years he has been associated largely with sales work, where his intimate knowledge of manufacturing conditions, as related to consumers' requirements from an economical viewpoint, proved invaluable to him. Although Mr. McCarty is an authority on all subjects connected with the manufacture of leather belting, it was as a salesman that he established his most enviable record.

Mr. McCarty will make his headquarters at the New York branch of the Chicago Belting Company, 127-129 Water Street, New York City. He will have charge of all sales in New York, Pennsylvania, Connecticut, Rhode Island, New Jersey, Maryland, Delaware, Virginia, West Virginia, District of Columbia, and will also have supervision over all export sales.

L. H. BECK, who for the past fifteen years has been connected with the Georgia Cotton Mills, at Griffin, Ga., the last five years as general superintendent and manager, has resigned and has accepted the position of superintendent and manager of the Hart Mills, Tarboro, N. C.

GEORGE F. PAYNE has resigned his position as superintendent of the Mount Royal Branch, Dominion Textile Company, Ltd., Montreal, Canada. C. T. Peck, who was formerly overseer of carding at the Slater Yarn Company, Pawtucket, R. I., succeeds Mr. Payne as superintendent at the Dominion Textile Company, Ltd.

ARTHUR T. SMITH, for several years superintendent of the Nottingham Mill of B. B. & R. Knight, Inc., at Providence, R. I., and a veteran Rhode Island mill man, died at his home in Providence recently. He was a native of Pittsburgh, Pa., and was 62 years old. Mr. Smith was also well known throughout the South, having served as superintendent at Atlanta, Ga., and at Langley, S. C.

FRANK E. HEYMER has resigned as superintendent of the Piedmont Mills and the Egan Yarn Mills, at Egan, Ga.

W. A. REID, who has been superintendent of the Pelham Division, Consolidated Textile Corporation, at Pelham, Ga., for a short while, has become superintendent of the Piedmont Mills and the Egan Yarn Mills, at Egan, Ga., succeeding Frank E. Heymer.

CASON J. CALLAWAY, of LaGrange, Ga., president of the Cotton Manufacturers' Association of Georgia, and director of sales and finances of the Callaway group of Mills, is the happy father of a daughter, born on August 21, and named after her mother, who was formerly Miss Virginia Hand, of Pelham, Ga.

R. G. MIMMS has been appointed overseer of weaving at the LaFayette (Ga.) Cotton Mills, succeeding Henry Busby.

H. S. Gibbes, who has been connected with the Lyster Chemical Company, Inc., of New York, for several years, has resigned and become connected with The Norvell Chemical Company, 11 Cliff Street, New York, and will handle the sale of their hardwood creosote oils for the entire United States.

L. J. SWINK has been elected superintendent of the W. S. Gray Cotton Mills, Woodruff, S. C., succeeding J. A. Jenkins, resigned.

ALLEN STILES has accepted the position of assistant superintendent and overseer of weaving at the Avondale Cotton Mill, Humboldt, Tenn In the latter position he succeeds L. K. Kirkman, who has resigned to accept a position with the Bemis (Tenn.) Cotton Mill.

JOHN L. HARPER has accepted the position as overseer of spinning at the Knoxville (Tenn.) Cotton Mills.

ROY WALKER has been appointed overseer of spinning at the Grantville (Ga.) Hosiery Mills.

G. R. COLLINS has been made overseer of spinning, spooling and warping at the Santee Mills, Bamburg, S. C.

H. M. MCABBE has been elected overseer of weaving at night at the Thomaston (Ga.) Cotton Mills.

L. G. GOODMAN has been promoted from second hand to overseer of carding in Mill No. 4 at the Riverside and Dan River Cotton Mills, Schoolfield, Va. He succeeds A. H. Goodman, resigned, who has accepted a place with the Savona Mfg. Co., Charlotte, N. C.

H. C. FLOWER, JR., who has been associated with the Durham Hosiery Mills in their New York office for some months, has sailed for Europe, where he will visit the foreign offices of the company, located in France, England, Belgium and Denmark. He will also visit Germany for the purpose of making connections there for his company.

Time was when you liked to take a chance on a lucky packet, but you do not use that method in business.

Warren Soap and Warren Service combine the accumulated experience of a large part of the textile trade during fifty years with the most up-to-date scientific investigation.

The Warren Soap Manufacturing Co.
77 Summer Street, BOSTON, MASS.
Established 1870 **Incorporated 1890**

STRAIGHT LINE METHODS

Loss

LOSS is the nightmare of things that might have been — the dark alley of ignorance—the gamble and the guess.

PROFIT is the golden apple of all commercial effort — the bright way of knowledge, system and method.

Loss is retrogression.

Profit is progress and success.

Real *Profit* begins where *Loss* ceases.

The elimination of loss to the minimum is as necessary to successful business as profit itself; for the saving made thru the prevention of mistakes, inefficiency and waste, is profit —just as the difference between cost and selling price is profit.

There is only one *sure* safeguard against loss—sound methods of Cost Accounting and System. But even these do not go far enough. There must be organization, personnel, system — regulated by adequate inside auditing safeguards, so that organization and system will harmonize into a well balanced and effective force for better business.

Such methods detect inefficiency and waste. They furnish the executive with timely and dependable facts and figures from every department — the absolute and only basis of intelligent, progressive and *profitable* action.

ERNST & ERNST

AUDITS - SYSTEMS
TAX SERVICE

NEW YORK	CHICAGO	CLEVELAND	CINCINNATI	NEW ORLEANS
PHILADELPHIA	MINNEAPOLIS	BUFFALO	INDIANAPOLIS	DALLAS
BOSTON	ST. PAUL	PITTSBURGH	TOLEDO	FORTH WORTH
PROVIDENCE	ST. LOUIS	DETROIT	ATLANTA	HOUSTON
WASHINGTON	KANSAS CITY		RICHMOND	DENVER

STRAIGHT LINE METHODS

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

The Relation of the Treadle to the Cam.

EDITOR COTTON:

The relation which the harness treadle bears to the harness cam is a matter upon which few authorities have attached any great importance, and yet it is a subject upon which a great deal could be written. I believe, and I have good grounds for my belief, that very few persons who have the management of looms under their care, know even the fundamental principles upon which the action of the harness treadle is based, and even less of its relation to the harness cam.

This in itself is not a serious fault, providing that the looms under his care are left as they came from the builders, or only such changes made as may be prescribed by them, but the danger element enters into the situation when, as was quite often the case during the war period, a mill desired to change over a number of looms in a great hurry and upon appealing to the loom builders for the new type of cams, they were told that orders were booked for two years ahead, but that they would be glad to place an order on the books and deliver as soon as possible. Then the only thing left for the mill to do was to allow them to fill the order in any reasonable length of time or to obtain the cams elsewhere and the quickest way to do this was to get the patterns made and then have the cams cast.

This course again was very commendable if it was handled all right, but right here was one of the danger points. Quite often the mill in question was equipped with various types of looms, where the looms may have been all one make, but where the distance from the fulcrum of the harness treadle to the point of contact or the treadle roll was different, or the total length of treadle was different, or, again, the sweep of the crankshaft may have had a different length on the different types of looms, or the treadle stands not of the same length.

In order to illustrate this clearly, the sketches, Fig. 1, Fig. 2 and Fig. 3, are used, and I may say here that the particular case being described came under by personal supervision and I was called upon to rectify the trouble after the damage had been done. However, everything came out right in the end, but what a lot of trouble would have been saved if the man in charge had understood his business as he should have. But, recalling the various men I have known, it is my opinion that many of them would have done the same thing he did if they were placed in a similar position.

In writing this article it is not my intention to criticize, but to be of helpful assistance to any who may be looking for just this kind of information, and in saying this I can look back very clearly to the time when I should have been very glad to have seen a communication of this kind in some of the textile magazines.

To return to the subject in hand, I must go back to the summer of 1917, at a time when every mill was doing its utmost to get up to the highest possible percentage of production, and was adapting itself to the then varying conditions. I was approached by a certain party who told me that he wanted to make a quick change to a certain type of work and that there was no possible chance of his getting the cams from the loom builders, and he wanted to know if it would be advisable to have patterns made and the cams cast in the local foundry.

As the matter presented no formidable difficulty to me, I said "Yes," and told him I certainly should do so as the order in question was a large government contract and was certainly worth going to a whole lot of trouble for. I sug-

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

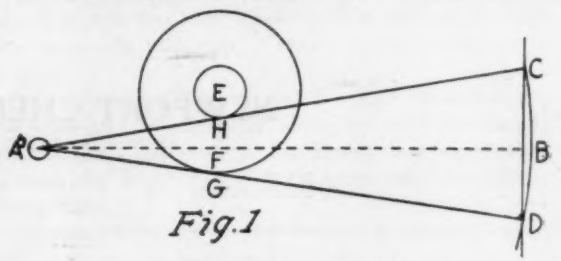


Fig. 1

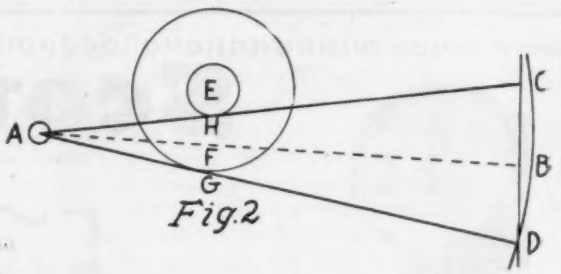


Fig. 2

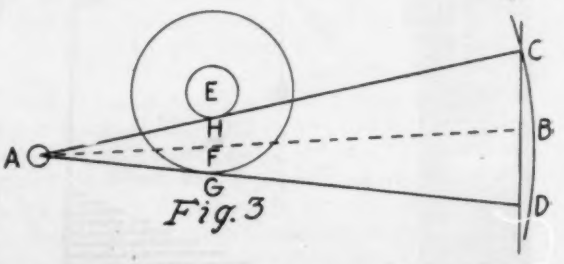


Fig. 3

THE NEWPORT COLORS

For Cotton and Cotton and Silk

The Best Developed Blacks
Newport Developed Black 2 B N
NEWPORT FAST BLACK V
(Zambesi Black V)
Fast, Bloomy, Intense.
Alike on Cotton and Silk.

NEWPORT
TRADE MARK
"COAL TO DYESTUFF"

NEWPORT CHEMICAL WORKS, Inc.
PASSAIC, NEW JERSEY

BOSTON, MASS.
PROVIDENCE, R. I.

Branch Sales Offices.
GREENSBORO, N. C.

PHILADELPHIA, PA.
CHICAGO, ILL.

Scott Testers

CONSIST of an extensive line of machines suitable to all kinds of testing. For use in analytical work and routine checking of the mill production, they are reliable—strongly built and free from repairs. The easiest and quickest to handle and the accuracy of the results are beyond question. We refer to any of the authorities on textiles, the government departments, and the trade in general. Testing apparatus is not expensive and soon pays for itself in many ways.

May we send you a catalog?

HENRY L. SCOTT & CO.
PROVIDENCE, R.I.

gested a certain draftsman in the neighborhood who, although not strictly a man acquainted with this type of work, still he was one I knew had the ability to do the job provided he had the right kind of support.

After I had made this suggestion I did not hear any more of the matter for a few days, other than to be informed that the man in question had been started on the job, until one day the draftsman came to me and asked, "Say, where shall I get the necessary details for this job?" "From the overseer of weaving, of course," said I. "But," he replied, "I can't get anything from that fellow. He doesn't know himself." "Well," I said to myself, "here is a nice state of affairs, and I knew it was no use to send him to the superintendent as he had formerly been overseer of spinning and didn't know anything about the matter. So, to make a short cut of it, I saw the party who had first approached me in the matter, and it ended in my going to the plant myself and furnishing the draftsman with the necessary items. At this time I took occasion to ask the overseer if the looms he was going to put on this class of work were all the same make and the same type as the ones we had seen and he said, "Yes, they all use the same kind of cams," so I let it go at that.

Work was started upon the cams and the first set put on the looms and found to work perfectly. After this the work was rushed right along and the draftsman and I settled down to other work, but we were surprised one day to receive a summons to come to the mill, stating that there was something wrong with the cams, as the harnesses were not working right, and this in spite of the fact that everything had been going fine up to this time.

At this point I wish to call attention to the design in Fig. 1, in order to show conditions as they should exist, providing everything is o k on the loom, and to give a few explanatory words for the layman.

Figure 1 shows a sketch representing the general outline of the method of operation of the harness treadle. A is the fulcrum of the harness treadle, B is the center of the path of movement of the harness treadle, E is the center of the auxiliary camshaft. F is the position which the treadle should occupy with the harness level. G is the position which the treadle should occupy with the treadle depressed while H is the position it should occupy with the treadle raised. C and D represent the arc which the treadle should describe, while the straight line drawn through these points prove the fact that any member attached as at B will, upon being raised and depressed, cut exactly through the upright line, insuring its being exactly in line when at its highest and lowest points.

Now to get back to the trouble in hand, the draftsman and I went to the mill in question and, seeking out the overseer, I asked him what the trouble was. He said, "The harnesses are not working right on some of the last looms started up." Here I interrupted him with the question, "But what of the looms previously started up?" "Oh," he replied, "they are running fine." Then my suspicions were aroused and I asked him, "Are you sure these looms are all of the same make and type?" and he said, "I guess so." I repeated, "Are you sure," and he said, "Well, no."

I asked him to let us see the looms, so we went into another room where the looms last started up were located, and as soon as I saw them I knew that these looms were not of the same type as the others, though they were of the same make. The motion of the harness at once told me the whole story.

Figure 2 shows the condition I found on all the looms which has been started up in this room, and needless to say, the harness were working with a very jerky movement and the weavers were having a very hard time keeping the looms in operation, and were making a lot of second quality work as well. A study of the sketch shown in Fig. 2 will show that on no account can perfect work, or a good running loom, be expected when this condition prevails.

As soon as I had diagnosed the trouble, I asked the overseer if there had been any change made on the looms since he came there. He started to say "No," but paused and said, "Yes. Sometime ago we threw out some other looms which were on four harness work and as we had these looms rigged up for two-harness work and thought that at some future time we might want to change to four-harness work, it would be a good idea to take off these treadles and treadle stands and put on the four-harness ones instead."

At this point I again interrupted to ask if it had ever occurred to him that those treadle stands might not fit this other loom. He said, "No, I always supposed they were the same."

Then I borrowed his rule and measured the stands on those looms and the ones on the looms that were running all right, and, as I expected, we found that they were quite a little shorter than the ones on the looms which were running all right.

The overseer then asked what we were to do, and I said, "Well, we have two courses open to us. One is to change the treadle stands and the other is to change the cams and draft up a special cam for these looms." However, upon further questioning, the overseer brought out the fact that ever since putting on those stands, the looms had never run so well as they had previous to that time. I told him I knew it, and that I should suggest changing the stands, as that would be the more economical and also would remedy the trouble for all time. This was done as quickly as possible and no more trouble was experienced, and, furthermore, the fact was noted that this point alone brought up the production from 12 to 15 per cent over what they had obtained on these looms before.

The reason for this is clearly shown in Fig. 2. This, as stated, shows the condition which I found on the looms. Looking at the arc CD, it will be seen that the straight line does not cut at D if started at C and therefore the harness must be further back when depressed than when raised, and this, besides being detrimental to the good running of the warp yarn, will also cause a good deal of chafing of the harness, resulting in a tremendous amount of harness breakage and thus shortening the life of the harness very materially.

Figure 3 shows a sketch of the condition which would exist if the treadle stand were too long instead of too short.

In addition to the points here noted, I wish to point out the fact that, as I have mentioned before in this article, the length of the treadle, the distance from the fulcrum to the point where the treadle comes in contact with the cam, and the sweep of the lay, all have a very decided bearing on the good running qualities of the harness motion and will certainly disturb the pleasant relations which most certainly should exist between the harness treadle and the harness cam. As stated in my article in the November, 1920, num-

ber of COTTON, on "The Relation of the Shuttle to the Harness Cam," one of the main points to be noted is the measuring of the distance from the center of the auxiliary cam shaft to the center of the treadle roll. If this is not carefully taken, or, if as some draftsmen seem to be in the habit of doing, is ignored altogether, then but one result can follow, and that is bad shedding, which can have but one outcome—low production and second quality cloth.

Also, I wish to add in closing that if the item just discussed is not attended to as it should be, then the results obtained will be identical with those shown in Fig. 2 and Fig. 3. The fact that this condition was not caused by that particular trouble has no bearing on the situation, as if space permitted, I could cite at least five or six causes for this same condition. Benjamin (Conn.)

Twist On the Fly Frame.

EDITOR COTTON:

I notice in the June issue of COTTON that "G. C. (Vosges, France)" presents two interesting questions for discussion. His second question is similar to the one presented by "J. S. B." in the May number, which I have answered in a previous letter.

Is the twist per inch in the roving the same on the two rows of spindles on a fly frame? asks "G. C." My answer is "No." The twist is greater in the second row. Why? Because the fly frame is the most imperfect machine in a cotton mill.

To put the twist in the roving we drive the spindle and flyer at a positive speed, and in direct relation to the front roller speed. Now, let us assume that the circumference of the front roll is exactly three inches, and the spindles make twelve revolutions to one of the front roll. In this case we would have four turns to the inch on both rows of spindles. Now, if the strand was clamped at the top of the spindle, or in other words, if the strand was held as firmly at the top of the flyer as it is held by the drawing rolls, we would have exactly the same twist in both rows. But twist does escape at the termination of the presser pad on all fly frames, and for this reason the figured twist is never attained.

One might be tempted to ask here, if the twist does escape at the termination of the presser pad, this should not change the twist any more in one row than in the other. No, but the twist will vary in the same row for the simple reason that the same pressure does not exist at the end of every presser pad. This is a fact, and proves that we have a loss of twist on both rows of flyers under the best of conditions on any fly frame,

The most vital part of the question is, why is more twist attained in the second row than in the first? Now, if "G. C." and other readers will examine closely what follows they will have proof that there is more twist in the back row.

There is not one practical man but who will admit that a tight tension is noticed by the ends in the back row snapping. Why? Because the distance from the drawing rolls to the surface of the bobbin is shorter on the back row, and of course, less able to stand the stretch. Owing to the distance being much greater on the front row, the strand will often stand the stretch without breaking. It is this stretch that makes the difference in twist in the two rows. When the length of the strand is increased by stretching it, the number of turns to the inch is reduced.

I would like to have the readers look up the May, 1917, issue of COTTON and turn to page 410. Here "R. W. A. (Ala.)" states, "Raise the bobbin, turn it back a half or a whole turn, start the frame, and it will take from twenty seconds to one minute, according to the slackness of the end, for the slack to be taken up. This slack is taken up gradually in the above stated time, meanwhile the strand is wound on the bobbin in a very loose and incompact form. This will show that no stretch takes place in the other ends, unless the tension is too tight. Try it and examine the roving."

I never answered the foregoing at the time, for I knew "R. W. A." would not be convinced. When a man claims that slack on any bobbin-lead fly frame is wound on the bobbin in a very loose form, he knows very little about the functions of the flyer from the beginning to the ending of the set. Like a few others, "R. W. A." rushed to the defense of the bobbin-lead frame, but since his letter in the May, 1917, issue, we have had the confession of a few mill men that they were puzzled. The readers will admit that I did my best to prove the bobbin-lead the wrong system. Oh, yes! The bobbin lead is o k, it stretches the roving a little, outside of that it is almost perfect.

Wash (Conn.)

Increasing the Breaking Strength.

EDITOR COTTON:

After reading the valuable information contained each month in your magazine I would like to ask for some that will apply directly to my own difficulty.

I am running 1-inch cotton. I have an opener with a porcupine beater revolving 1,600 r. p. m.; a breaker with a two-blade beater running 1,500 r. p. m.; an intermediate with a two-blade beater revolving 1,450 r. p. m. and a finisher with a two-blade beater running 1,450 r. p. m., making a 45-inch lap. The finished lap weighs 15 ounces to the square yard. The feed rolls are set to within ¼ inch of the beater, and the card sliver is 60 grains. We have two processes of drawing frames making a 65 grain finished sliver. We make .50 hank slubber roving, 1.25 first intermediate roving, and 4.10 hank finisher roving. We are spinning 20s, 22s, 25s and 28s. The yarn break is away down low and I wish to remedy it, so I ask the readers of COTTON if they can help me in this problem for a stronger break, and make any helpful comments in regard to my organization. I think I am beating the cotton too much.

J. L. D. (R. I.)

EDITOR COTTON:

I am of the opinion that "J. L. D. (R. I.)" is beating his cotton too much, and he should try reducing the speed of his beaters, say, 10 per cent, and see what results he gets. Then, too, I think he has his weights too heavy causing him to have to draft down too much to get the 4.10 hank roving for the spinning. The weight per square yard on the finishers seems all right.

I am at present making the same numbers as "J. L. D." is, and the following is my line-up: I use a 1-inch staple cotton, and have a three-blade opener beater, making 1,185 r. p. m., and set the blade of the beater to ¼ inch of the feed rolls. This setting is made when the blade

is sitting perpendicular to the top and bottom feed rolls, the blades divided as much on the top as on the bottom rolls, so the pitch of both rolls is the same to the blades. Then I slip the gauge down between the face of the blade touching both top and bottom rolls and the blade.

Next, I am using a two-blade breaker beater, running 1,385 r. p. m. This blade is also set to ¼ inch from the feed rolls, like that of the opener beater. I have no intermediate lapper, having found out some time ago that I could get stronger yarn with this process out, so I stopped them off and omitted this process.

The finisher picker has a Kirschner (three-blade) beater running at 1,150 r. p. m. The blades are set to 3/16 inch of the feed rolls, making a lap that weighs 11½ ounces per square yard.

I am making a 50-grain sliver on the cards, and a 58-grain sliver on the finisher drawing. The front roll on the drawing frames makes 300 r. p. m. The slubbers make a .60 hank roving; the intermediates a 1.80 hank roving; and the finisher roving frame makes a 4.00 hank roving, with medium twist in all roving. I take care not to twist too much as this will cause uneven drawing of the roving which makes uneven and weak yarn. My number 22s yarn breaks at 95 pounds.

Of course there is much that could be said in regard to cleaning and oiling, but that's generally understood by all. Stripping of the cards must be watched; care should be taken that the sliver gets its proper weight before the end is gotten up after stripping the cylinder and doffer; gauging should be done evenly; piecing at all points done evenly; the speed should not be too high on any of the machinery; the evening points should do their work properly on the pickers; and all white cotton waste should be mixed evenly in the opener hoppers.

I hope the foregoing will give "J. L. D." some assistance in his difficulty, and I would like to request a reply from him if he should try it out, so we could see how the proposition works with him. T. A. D. (Ga.)

EDITOR COTTON:

Replying to the question of "J. L. D. (R. I.)," I wish to say that I have had quite a lot of trouble with yarn breaks. I have tried a good many things looking toward correcting this trouble and have been getting goods breaks, above Draper standard, for the past several months.

I note that "J. L. D." is running 1-inch cotton. There are different characters of 1-inch cotton, however, but I assume he is running a good character as well as staple of cotton.

In the first place, I believe he is right in thinking he is beating his cotton too much. I would reduce the beater speed from 1,500 r. p. m. on the breaker to about 1,350 r. p. m., and also reduce the speed on the intermediates and finishers from 1,450 r. p. m. to about 1,250 r. p. m. Since he does not give size or speeds of feed rolls, we have no way of ascertaining the number of blows per inch being made. I have tried from 30 to 80 blows per inch, and the best results were obtained with 50 to 58 blows per inch. Although my numbers are coarser than his, I believe he would get the same results.

I believe that his lap is entirely too heavy. I do not think his 45-inch laps should weigh over 14 or 15 ounces. I do not think there is anything wrong with the setting of his feed rolls and do not believe it would be well to change them either way.

I note that he is spinning 20s, 22s, 25s and 28s from 4.10 hank finished roving, but he does not state whether or not he is having trouble with all of his yarns or only a part of them. I think he should change his hank roving for 20s and 22s, making a little coarser roving for these two numbers, or a little finer roving for the 25s and 28s.

If I had "J. L. D.'s" lay-out in my mill and was having trouble with yarn breaks as he is, I would first see that I had 1-inch staple good character cotton. Next I would cut down on the beater speeds and reduce my lap weight, then, as an experiment, I would make a little coarser roving on all processes, say, about .48 hank slubber roving, 1.15 or 1.20 intermediate roving and about 3.80 hank finished roving for 20s and 22s and would leave the 4.10 hank roving as it is for the 25s and 28s yarns.

I don't know whether these suggestions will do "J. L. D." any good, but I hope so, and in the event that he sees fit to try them, I would like to hear through COTTON what results he gets. Superintendent (Ga.)

EDITOR COTTON:

"J. L. D. (R. I.)" is certainly beating his cotton entirely too much. The blows per inch should be sufficient to clean the stock but the 1,600 r. p. m. on a porcupine beater is entirely too high. There are some mills now running 36-inch porcupine beaters at a speed of 550 and 650 and 800 r. p. m. with good results. On the intermediates these same mills run a two-blade beater at a speed of 850 and on the finisher picker the beater is making 860 and is also of the two-blade type. These speeds may appear very slow but experience has proven that it is not only the blows per inch that count but also the force that the blade has when striking the fiber. The feed is speeded up to keep up the production.

Mills running on 20s, 22s and 28s as a rule run a lighter lap than 15 ounces per yard and 15 ounces to the square yard on a 45 inch lap will make the lap weigh 18.75 ounces to the yard which is entirely too high. This gives about 16.7 ounces to the yard in comparison with a standard 40 inch lap. A standard 40 inch lap for this class of work should be about 12 ounces per yard.

The drafts used by "J. L. D." are 3.90 for slubber, 5.00 for intermediates, 6.55 for speeders. The spinning drafts are 9.75 for 20s, 10.75 for 22s, 11.6 for 25s and 13.6 for the 28s. All of these drafts are moderate save the draft for the 28s. 5.00 hank roving should be used for this as a minimum giving a draft of 11.2.

There are so many things that might be suggested which may be the cause of the low breaking strength, as for instance, too close setting of the feed plate to the licker-in, excess twist in the roving, especially the fine roving. It is a common fallacy that the more the twist put into the roving the greater will be the breaking strength of the yarn. The opposite is true for the insertion of twist in the roving necessitates more friction in the drafting especially in the spinning, which strains the fibers.

R. J. W. (R. I.)

EDITOR COTTON:

Before the question asked by "J. L. D." can be answered properly, it will be necessary for him to give quite a little more information than what he has already stated.

The CHICAGO
Approved Portable
WATCHMAN'S CLOCK

Clock with case opened showing Dial in Place and Partial Registration.

with its special Waltham movement, its lock stations and its superior quality throughout, is especially desirable for mills and factories and for either in-door or out-door patrol.

Write for Catalogue.

CHICAGO WATCHMAN'S CLOCK WORKS

CHICAGO 1526 S. Wabash Ave. | NEW YORK 11 Church St. | ATLANTA Grinnell Co., Inc.

Acme DOORLESS Baler

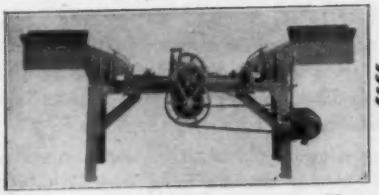
Patents Pending

A 600-lb. bale of **Cotton Waste** measures 60 x 22 x 22 when compressed in the **Acme** Doorless Baler. Consider the large saving in storage room and the greater quantity you can load in cars. Built in numerous sizes and pressure capacities.

Galland-Henning Mfg. Company

MILWAUKEE, WIS.

SOUTHERN SALES REPRESENTATIVE:
THE LOVINGOOD COMPANY, Atlanta, Ga.



BUSINESS IS ALRIGHT

The only thing needed is to cease our pessimistic talk. Forget the "Hole in the Doughnut."

Three years ago everyone was intoxicated on prosperity. Then a change came, and everyone began talking about "Rotten Business." This talk continued, until finally, we began to believe everything we heard. We were more intent on putting the other fellow's house "In Order" than we were our own.

There are over ONE HUNDRED MILLION CONSUMERS in this United States, everyone of whom is a prospective customer.

It's the awakening of the stupendous *buying power* of these ONE HUNDRED MILLION CONSUMERS that will BRING PROSPERITY.

THERE IS PLENTY OF BUSINESS TO BE HAD BUT IT REQUIRES WORK TO GET IT. ARE YOU GOING AFTER YOUR SHARE?

260 TEXTILE MILLS IN THE UNITED STATES AND CANADA HAVE INSTALLED "UTSMAN" QUILL CLEANING MACHINES, PREPARATORY TO TAKING CARE OF THIS INCREASED BUSINESS.

HAVE YOU INSTALLED YOURS?

The Terrell Machine Co., Inc., Charlotte, N. C.

He has given the length of the staple of the cotton as 1 inch, but has failed to give the grade of the cotton which is the most important feature in regard to picking and carding. If the cotton was perfectly clean it would need no beating other than to put it in lap form, while if it is very dirty, it will need considerable treatment. He has not given the diameter of his porcupine beater, but the speed of 1,600 r. p. m. seems high.

If "J. L. D." prefers to use a two-blade beater in all his pickers, I think he would get better results if he reduced the speed of his beater as a two-blade beater strikes a pretty severe blow. All his beater speeds are high, especially when beating on such heavy laps, which he must be using if he finishes with a 15-ounce lap. The feed rolls are also set fairly close for so heavy a lap.

Again, in the case of the card, it is not safe to give any recommendations until more is known. The character of the cotton should decide most of the fundamental settings and the amount of draft necessary. If "J. L. D." cares to give the settings of his mote knives, back plate, flats and front plate, with the detailed character of his cotton, and the make of his machines, we might be able to assist him more accurately.

If his break is "away down low," the first place for "J. L. D." to look is in the mixing room and be sure that his mixes are as even and as high as the run of his cotton will permit.

If "J. L. D." cares to give the additional information that is necessary to thoroughly know his conditions, I would be very glad to go a little deeper into the details which are necessary to really improve the work.

C. S. W. (Mass.)

No. 1 Versus No. 2 Flange Rings.

EDITOR COTTON:

I note the question of "C. S. W. (Mass.)," which was published in the August number, and would like to present my views on the subject of number one and number two flange rings.

First, I would like to know what is to be gained by running a number one flange ring. I have heard this question discussed quite a number of times, but I have never yet had anyone explain to me why a number one flange would give better results than a number two flange, especially on coarse work. I am not a knocker by any means, and am always willing to try anything new and to give it a fair test before expressing my opinion on the merits of it.

I have been using a number two flange ring on coarse work for years, and have never had any trouble with them. On the other hand, I tried out a few frames with the number one flange on 7s and 8s yarn, and they did not prove satisfactory at all. I am of the opinion that a number one flange ring will run all right on fine yarns, say 30s or finer. I do not mean to say that they will not do all right on coarse yarns, I only know that the ones I tried gave me a lot of trouble and kept my spinners torn up and dissatisfied as long as they were in use.

I am aware of the fact that mill operatives generally are not inclined to want to try out anything new, especially if the old method is anything like satisfactory. For this reason a test such as I have mentioned, if left with such operatives, would not be a fair one. At the time I tried out these number one flange rings I had a first class section man in charge of the frames and also had one of the best second hands in the room that I ever knew; therefore, I know that the rings were given a fair test. We did not run them for a few days, or a few weeks, but for months. We had about 45 per cent of the room on number one flange and the remainder on number two. This, of course, gave us a chance to test them out together. The entire room has since been changed back to number two flange rings, and I doubt if there is a spinning room anywhere running on the same numbers and getting higher efficiency.

Now, as I previously stated, I am not a knocker. The number one flange ring may, in some instances, give as good or better results than the number two flange. I am merely giving my experience and expressing my views on the matter, but as previously mentioned, I would like to have someone explain the advantages of a number one flange over the number two, especially on coarse yarns with a large ring. I am of the opinion that if someone would try out a 2½ flange ring on very coarse yarns, say 6s and 7s, they would be found to give even better results than the number 2 flange. Although I do not know that there was ever any number 2½ flange rings manufactured, I presume it could be done.

If I were contemplating starting a mill on the lay-out mentioned in "C. S. W.'s" letter, I would put in the number two flange ring.

As to travelers, I would specify no special make, as the manufacturers all make good ones. However, I would use a square point, narrow style, circle two. I merely mention the square point because I have used it satisfactorily for years. However, I know of mills that are using the round point and getting good results. Superintendent (Ga.)

EDITOR COTTON:

In reply to the communication of "C. S. W.," I would recommend the number one flange as I find that I can run the front roll faster, have fewer ends break down and have a more even tension throughout the traverse than when running a number two flange ring.

The number one flange ring is made especially for fine counts and large rings, still as "C. S. W." is making a slack twisted yarn, I believe he will find a noticeable improvement in the number one flange over the number two flange though his rings are rather small for the counts he is running.

I would recommend a Hicks style, square pointed traveler in about a number 12 to give the best results, though he must experiment with travelers of different numbers to find which number runs the best under existing conditions.

Kenduskeag (Canada.)

EDITOR COTTON:

In answer to "C. S. W.'s" first question, I would recommend the number one flange ring by all means. The reason for this answer is best understood by comparison of results obtained, but it can be proved from a technical standpoint.

The best way to determine the right number traveler is to try about three numbers near the size that it is expected will be needed, and compare results. However, as a good starting point for 9½s yarn, on 1⅝ inch, number 1 flange ring, I would suggest a number 7, No. 1 flange, 1½ circle,

K-G

Spinning, Twister, Spooler

TAPE

is made of the best material by expert workmen.

Is the finest woven.

Has the smoothest edges.

Has all the qualities necessary for long life.

An honest product.

You have only to use to be convinced of its superiority.

Samples on request.

Manufactured by

Knit Goods Specialty Co.

26 Paine Ave.,
Chicopee Falls, Mass.

BOSTON HANK CLOCKS

The Recognized Standard for Accuracy and Durability

Many thousands in use.

Lasts many years.

All parts interchangeable.

Prompt delivery.

Special clocks to order.

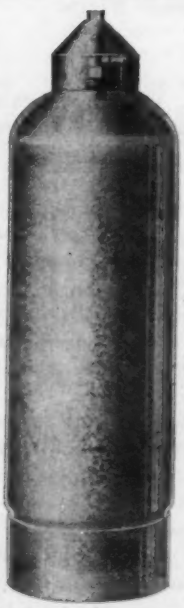
Write us your requirements.

Our experience is at your command.

Boston Clocks tell just what the production from each frame actually is

BOSTON MACHINE WORKS CO.
LYNN, MASS. U.S.A.

Offices at
Cincinnati, Ohio. Milwaukee, Wis. St. Louis, Mo.



COTTON MILLS SHOULD USE

Commercial Acetylene For Welding

Supplied in portable cylinders on loan basis without deposit.

Only the purest gas can safely be trusted to meet the exacting demands for cotton mill welding repairs. Commercial Acetylene is a gas of absolute purity.

WRITE FOR OUR SERVICE AGREEMENT

Commercial Acetylene Supply Co.

204 Trust Company of Georgia Bldg., Atlanta, Ga.
Main Office: 30 Broadway, New York City
203 S. LaSalle St., Chicago

Aurora, Ill. Boston, Mass. Bound Brook, N. J.
East Deerfield, Mass. Toronto, Ont. San Francisco, Cal.
Moberly, Mo. Berkeley, Cal.

square point, ring traveler. If this is found to be too heavy, try a number 6.

Unless "C. S. W." has some good reason for twisting the yarn but 9½ turns, it is the writer's opinion that about 9¾ turns or possibly a little more would be an advantage in the running of the work.

Allow me in turn to ask a question. Why not run single roving for 9½s filling? B. R. B. (S. C.)

Two Versus Three Processes of Picking.

EDITOR COTTON:

After reading "T. A. D.'s" letter in the July number on "Cone Belts and Tension," I would like to ask him wherein he can see a benefit in removing the intermediate picker and produce better work, and also in what way he can prove it. It seems to me that if he could do away with the intermediate pickers and produce better work, he also could do away with the finishers and get still better results.

I would like to relate a little experience I once had along this line which serves, to my mind, as proof that taking away a process in picking is more harmful than helpful as to results.

I once worked in a picker room in a New England mill of high standard. We had four breakers, four intermediates and five finishers, doing 90,000 pounds per week, and the finisher beater was traveling at the rate of 1,500 revolutions per minute. I ran those pickers myself, and in a 9¾ hour run I never had to turn back or set aside over six or seven laps, using an allowance of ½ pound each way from the standard weight for the lap being made.

Since that time, I have started up, and am now running, a new picker and card room, equipped with the same kind of pickers, with the exception that the beaters are making 1,250 r.p.m., and only two breakers and two finishers are being used. We are producing 35,000 pounds in 110 hours. These pickers are in as excellent condition as the ones used in the three-process picking just mentioned, and in the course of a day I have turned back as many as twenty to twenty-five laps as being off weight.

On the three-process picking, the drawing was sized twice a day, and it was very seldom necessary to change a gear on account of off weight, while on the two-process picking there is seldom a day goes by that we do not have to change some gears.

In my opinion it takes at least three processes of picking to get a lap into a flexible state, even throughout as to weight, and into an excellent working condition. Take away one process, and the lap and cotton is in only two-thirds of its proper state of being in a good working condition.

The cards will not even up the variation in weight, and although a two-process drawing will, to a certain extent, have a tendency to correct this fault, the loss of one process of picking is felt even to the end of the spinning room, especially when yarn is spun from single intermediate roving.

One might compare hard waste passing through a two-beater waste picker to putting it through a five-beater waste machine. Also, compare hard compressed cotton from a bale passing through a vertical opener and two processes of picking, with the same cotton being passed through the same equipment with one more picking process added. The similarity of action in both cases will be found to be close. The product from a five-beater waste machine is in better shape to be reworked, while if put through a two-beater machine, it shows hardly any action toward a good product for re-working. Therefore, cotton put through three processes of picking will be in a better condition in every way for better, cleaner, evener and stronger yarn in the subsequent processes. K. (Ohio.)

Card Clothing Wire.

EDITOR COTTON:

The subject that "E. D. W. (Mass.)" would like to have discussed is a good one. I hope many readers will give their views on this question which appeared on page 709 in the July number under the heading "Asks Information Concerning Card Clothing."

Carding is the most important process in cotton yarn preparation, and is the basis for strong or weak yarn. The card has three objects: First, to disentangle the fibers of cotton; second, the removal of all impurities too light to be removed by the picking machines; and third, the reduction of the weight per yard of the material and forming the sheet of lap into a sliver.

By his letter, I believe that "E. D. W." has started something that will have a long ending. Why? Simply because we hear carders often remark about which builder makes the best card, but never a word about the *card clothing*. It is the card clothing that does the work. All cotton cards are built on the same principle. They all consist of a cylinder and doffer, covered with clothing, which act upon the fibers.

The first point to consider when clothing a card is to have a true cylindrical surface on the cylinder and doffer, and second, the quality and quantity of the work being produced. For a heavy lap, say about 13 ounces per yard, making a 60 grain sliver, I would use the following number of wire. On the cylinder 33s, on the doffer 34s, and if a clean stock is to be run I would have number 34s on the flats also, but for uneven staple and dirty stock I would use 33s.

For a medium mill running a lap weighing not more than 11 ounces to the yard and making a 50 grain sliver, I would use 34s on the cylinder, 35s on the doffer and flats. For very fine work, 35s on the cylinder, 36s on the doffer and 37s on the flats.

Now let us consider the first object of the card. If we have a heavy sheet of lap consisting of wiry cotton that must be disentangled, the extreme delicacy of the fine points of wire must be considered. In such a case, no finer wire than 33s should be used which is equal to 100s in English counts.

The second object of the card is the one on which opinions vary most, for the reason that the quality of the work makes a great deal of difference. Many carders conceive the idea that the finer the wire on the flats, the cleaner the work, but such is not the case in all instances. True, the builders make a difference of 3/1000 inch from the toe to the heel of the flat in order to form a space for the foreign matter to lodge in. But in case of very fine wire and very dirty stock, what happens when this space fills? The flats become clogged, and for the reason that there are

"EYES RIGHT"

Shambow Shuttle Company has Right Hand Eyes for Automatic Loom Shuttles.

Southern Representatives:

The Walraven Company

Atlanta, Ga.

Shambow Shuttle Co.

Woonsocket, Rhode Island

GARLAND

THE GARLAND LOOM HARNESSES

have the right "feel" and appearance.

An important feature of our loom harnesses is their appearance and their "feel." Their smooth finish and their freedom from defects show that they will weave well, and their soft pliable "feel" shows that they are tough and elastic and will therefore wear well.

TRADE MARK

GARLAND MFG. CO.

SACO, MAINE

J. S. HULME

Atlanta Trust Co. Bldg., ATLANTA, GA

Economy Presses.

Clenzall Dye Machines.

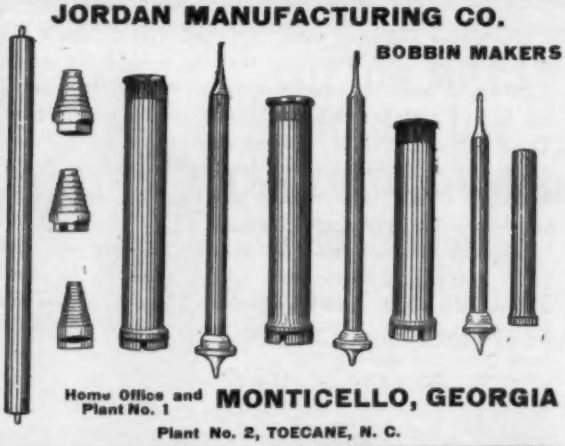
Watson Motors.

Water Softening Systems.

Green Houses.

JORDAN MANUFACTURING CO.

BOBBIN MAKERS



Home Office and Plant No. 1 MONTICELLO, GEORGIA

Plant No. 2, TOECANE, N. C.

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks. Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.

29 Beekman Street NEW YORK

The Walke Box Company, Inc.

NORFOLK, VA.

Manufacturers of

NORTH CAROLINA PINE BOX SHOOKS

too many points of wire to the square inch. For this reason, it is sometimes policy to have the same number of wire on the flats as on the cylinder. The object is to give space enough for the foreign matter to enter between the points. However, this is done only in case of very dirty stock and waste.

The stock must be transferred from the cylinder to the doffer, but all the fibers are not transferred the first time and some follow the cylinder one or more times, which of course injures all such fibers. Even if the doffer be covered with the finest wire, some fibers would escape the action of the doffer and follow the cylinder. Therefore, in the case of silky stock, it is advisable to use two numbers finer on the doffer and flats than on the cylinder.

On the other hand, the finer the wire, the more care is required, especially when grinding. Fine wire can be spoiled easily when grinding. Another point in using very fine wire on the doffer is not to grind the doffer more than 2½ hours when grinding.

A book could be written on this subject, but I think I have already taken up enough space on this valuable discussion. Let us hear from others. Wash (Conn.)

An Interesting Power Test.

An interesting engineering power test was made recently on looms at the Androscoggin Mills, Lewiston, Maine, to indicate the saving made in power when operating looms equipped with Hyatt roller bearings as against those equipped with plain bearings.

The looms in question were standard 40-inch Draper looms, weaving "coutil" cloth, and had been in service at the Androscoggin Mills for a period of approximately five years. They were identical in every respect, having been selected at random in the weave room. The roller bearing loom was equipped with three roller bearings on the camshaft, three on the crankshaft, one on the idler gear, two on the auxiliary shaft, and one on the loose pulley. The description of the cloth being woven, as given by the Androscoggin Mills, was as follows: number of ends, 3,874; width of cloth, 38 inches; number of picks, 76 per inch; sley, 104; warp yarn, 22s; filling, 15s; tape selvage. This was woven on the looms with six harnesses running four up and two down.

In arranging the equipment for the test, the looms were driven from a counter-shaft that was connected to the motors by belt, this arrangement being necessary in order to reduce the speed from the motors without changing the pulleys on the looms. The looms were "run in" two at a time for about one week before the official test was made. Preliminary readings were taken on the looms during the "running in" period, as a matter of record, to find the relative power consumption of each unit.

During the official test, the looms were run about three hours before the readings were taken. The following observations were made in connection with this test: (1) power input to motor, with loom weaving at 76 picks per inch; (2) power input to motor, with loom stopped and belt running on the loose pulley; (3) power input to motor, when driving the counter-shaft; and (4) power input to motor, when running free.

The adjustment of all looms was done by the overseer of the weave room and other loom fixers at the Androscoggin Mills, and they carefully adjusted the harness straps, picker arms, shuttle boxes, etc., so that all looms would be running under precisely the same conditions.

The net power supplied to each loom was determined from the power readings by the following formula: Net power (watts) to loom = input (watts) to loom × motor efficiency (at that load) — input (watts) to counter-shaft × motor efficiency (at that load).

The humidity and speeds were as follows:

	Roller Bearing Loom		Plain Bearing Loom		Plain Bearing Loom	Plain Bearing Loom
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Humidity during test....	86%	85%	86%	85%	86%	85%
Speed of loom	152 R.P.M.	152 R.P.M.	152 R.P.M.	152 R.P.M.	152 R.P.M.	152 R.P.M.
Speed of countershaft...	423	424	423	424	424	423
Speed of motot	1790	1790	1791	1788	1788	1790

The results of the official test, which was made in the forenoon of March 11, 1921, and which was made on the roller bearing loom and one plain bearing loom, are given in the following table:

	Watts	
	W. M.	Esterline
Average net power roller bearing loom.....	362	363
Average net power plain loom	447	444
Saving in favor of roller bearing loom.....	19%	19%

During the afternoon of the same day, supplementary readings were made on one roller bearing loom and three plain bearing looms, and the results showed an average saving in power in favor of the roller bearing loom of 23 per cent for both meters.

The official test was conducted in the presence of the following representatives; William H. Chase, Draper Corporation, Hopedale, Mass.; E. R. Holmes, Crompton & Knowles Loom Works, Worcester, Mass.; E. H. Erhard and S. S. Jackson, The Stafford Co., Readville, Mass.; James E. Coburn, agent, and Mr. Hall, superintendent, Androscoggin Mills, Lewiston, Maine; John F. Minnik, superintendent, Pacific Mills, Dover, N. H.; W. M. Pierce and A. R. Irvine, Lancaster Mills, Clinton, Mass.; Mr. Stevens, Arlington Mills, Lawrence, Mass.; and L. T. Brown and M. L. Brown, Bates Manufacturing Co., Lewiston, Maine.

Character.

EDITOR COTTON:

When things go hard with you, when everything seems to go wrong, when you are met by hard luck on every side, when all your future looks dark; it is then just the time to make up your mind that you can down the whole business and show the world there is something in you. What a man does in spite of all his adverse circumstances shows whether or not he has the staying qualities to make a man.

Most any overseer can run a room as long as the work runs well, labor is plentiful and everything going along smoothly. But when the work is running badly from some hidden cause, when no one seems to have any ambition to work, when everything seems to be determined to go wrong, then is the time an overseer's ability shows up; then is the time to find out if you have a man of character in the sense that the word character is used by Treu, when he defined it as the moral quality that makes a man know what he wants; does not allow his temper and moods to govern him, but makes him act on firm principles. You can put a learner on a section when the work is running nicely, when only a few warps are coming off and he will get along fine.

BLEACHERS!

You would prefer to peroxide-bleach goods, to obtain the permanent white without weakening, the softness and elasticity, the absence of "seconds"--if at the same cost--wouldn't you?

Will you let us show you how this can be done, without expense to you?

THE ROESSLER & HASSLACHER CHEMICAL CO.
41st St. and Sixth Ave.
NEW YORK

You can tie full warps on a set of looms and a 10-loom weaver can run 12 looms very nicely for a few days, but when several of the warps begin to run out and he has a pick-out about the same time, you will then see where you need the 12-loom weaver.

So it is with any kind of work, the man of experience, the man of character, shows up when everything goes wrong.

Man is naturally a lazy animal anyway and when the hard part of a job turns up he has a great temptation to ease over or get around the hard place. But that is not the way for a man to ever fit himself for a better position. Don't slip around the hard places—*go through them.* That will give the valuable asset we call experience which is one thing we must have to beat the other fellow.

F. G. (S. C.)

Effect of Changes in Length of Stock.

EDITOR COTTON:

It was with pleasure that I perused the article of "Bal. (Mass.)" in the June issue of COTTON. I hope "Bal" will live long and write on and on. I like "Bal," not because he believes in some of the things I state, but because he has the welfare of our young men at heart. That is the spirit.

I will start the ball a-rolling in regard to the articles he would like to see. In this case, let us assume that a change in the stock takes place, say from 1¼ inch to 1 1/16. How would this change effect the web at the card?

It all depends on the speed of the doffer, the condition of the comb and wire on the doffer, and also the position of the doffer comb. The weight of the sliver, too, plays an important part.

I have seen cases where a change in the stock would effect the web to such an extent as to lead one to believe the room was full of electricity. I have seen carders work for hours making an enormous amount of waste, without a remedy.

We all know that raising the doffer comb will increase the tension on the web, and that lowering the doffer comb will cause the web to sag. When the room is full of electricity and the web follows the doffer, if the comb is lowered, this will, as a rule, remedy the trouble, or if the web is sagging on a hot day, raising the comb will usually remedy this also.

But a change in stock is most puzzling. With long stock, owing to the strength of the web a slight tension can be attained without any trouble, but any slight change in the length of the stock will cause the web to roll up on either side of the comb, and eventually break the end.

Such a case is puzzling, for the reason that the position of the comb should be changed very slightly, say only ⅛ of an inch. In such cases, the majority of carders and grinders conceive the idea that the trouble is due to electricity. So the comb is lowered, but too much. When the web rolls up on the side of the doffer comb, just lower the comb about ⅛ of an inch and it will be found that the trouble will disappear.

Wash (Conn.)

It's a fine thing to dream about the future, but don't go to sleep on the job while doing it.

An Appeal for More Cooperation.

EDITOR COTTON:

The time has arrived in the textile industry for a concerted action upon the part of every mill manager toward satisfying the ideal desires that have formed within himself, and also the anticipated condition for which the masses of operatives throughout the country crave. The former, being an educated leader, is looked up to by a body of people set apart from each of the neighboring textile plants as a sort of a large family, so to speak, who depend to a great degree upon his leadership in every sense of the word, and his ability to cope with every desired detail that would place the organization upon that plane just a trifle higher than the one next door; though they should never forget that neighborly spirit which should exist between every organization in the same field, ever helping one another to aspire to those higher ideals that have the greatest weight for self-advancement, educationally, morally and physically.

In looking over the fields of industry, I find that the natural tendency of every operative, either high or low, is for advancement educationally. Years ago, we had an element of labor that seemed to be adapted to the conditions within our mills and one had to but teach a very short period of time before the crudest in the flow of labor grasped the fundamental principles of the industry and within a short period of time became a most proficient and skilled operative.

This condition, together with a less competitive market, formed a fellowship between the manufacturer and the employee that seemed at the time to culminate in nothing less than brotherly love, one for the other. But in later years, if I be allowed to speak of conditions in this manner, I think that the bridge between the employed and the employer has lengthened to an appalling degree.

First of all, that element of labor which formerly graced our mills has been allowed to drift out to other industries, where the lure of money has so captivated them and the type of work so grasped their thoughts that probably if they were approached in regard to returning within the mills the petitioner would be ridiculed, and perhaps he would be told that they never intended to follow their old vocation again.

This, to the writer, seems to be what might be called a dead loss to the textile industry. It would seem that if the line of education that was launched in years past for the final development of the cotton industry had been followed instead of neglected, the average textile employee would never have sought other vocations, neither would the antagonistic attitude be prevalent as is the case in our present day industries. There are a hundred things that have had a tendency to make the older employee feel that there is nothing to be gained by hanging to his or her old position or employer.

Past years have given us many efficient superintendents and agents who have gone up through the ranks and now are the leaders of the masses of employees today. A great many of these men have received their education in the so-called "University of Hard Knocks" and they make the most proficient leaders and educators. There is that element within them that makes for the highest ideals and these ideals they reflect in many, many ways, even down the line as far as the sweepers. They seem to have the ability to get from the very smallest as well as from the most responsible operative, that cooperation without which any industry is useless or helpless. They know the methods to follow in picking the leaders for their several departments; men that fall in with their employer in the greater development of his mills.

These conditions come the nearest of anything I can imagine to the old-time educational method and the only thing that keeps the back-bone of the textile industry intact. Of course, this method, like lots of other good things that we share with others in this age, is born, and not developed among the pages of literature. There were, or rather are, a great many of our leaders who were fortunate enough to fall into the hands of the most proficient of the old masters and received that textile education together with their broadmindedness that really has made them wonderful employers, reflecting what might have been done in a great many instances in other organizations, had every employer had that same instinct for reading human nature coupled with the ability to organize and maintain a brotherhood between himself and his employee.

Of course, when one has efficiently educated himself for the line of work in which he is destined to be the leader, it has a most decided weight upon the general outcome of his career, for if any man can issue orders from his executive office that indicate knowledge of detail and educational power for the highest production and accuracy, and do this without question, then and then only can he expect a just return from his organization. But—he has but to make one so-called "side glancing" order, due to lack of natural leadership, and his organization will immediately and instinctively turn to their own ability for results and from that time on the employer's efforts to organize are anything but fruitful. And they are the more unfruitful if he is of the type who tries to handle every part of the industry alone.

What a sad state of affairs it is when a leader can't rise to the heights, to see out beyond his sphere, to see the vast material locked within the brains of perhaps hundreds of his employees, that if developed by proper methods, would produce a harvest greater than could ever be gained by any amount of ordinary production. The lack of opportunity to demonstrate their ideas in a way to help themselves and their employer, is often the reason for much of the indifferent attitude among employees. Here is where the employer and the employee come to grief through misunderstanding.

This word covers a tremendous amount of the failures in advancement within our industry. By talking with any number of the younger element in most any department of a cotton mill one will find that the average thought is that there is no particular place that ever has or will present itself to the individual, and apparently, in many cases, his observation is true. And it is but a short step from there to actual disheartenment. One might, if he were on the alert for just these particular things about his organization, divert the prevailing current by reaching down and taking the disheartened one by the hand and leading him toward the steps of advancement in time to form and shape the ideas that are now nebular in his brain.

This particular type, the writer has found in several instances, is the ever ready and really intelligent man for the future development of the textile industry. It seems a pity, when we look over this great multitude of employees,

that there aren't the attractions thrown out by the leaders that will tend to induce more of them to avail themselves of the higher educational advantages offered. Would that I for one could so place my light that all could look upon it and feel its helpfulness.

There are so many of them who never have the facilities offered them to make them see their worth. This is where leaders who are leaders reap a harvest. The time has arrived when we need men who have the ability to bring out the employee and the mechanical end at the same time. Men who can step into a position directly between the employer and employee, and work in perfect harmony with both until he has so established their brotherhood and tied it up with a productive plant that both realize it is good to labor one for the other, and all for the mill.

First of all, there must be a man who can enter and arrange the mechanical branch so that every machine will produce its normal allotment and that portion of a quality that can't be questioned. By so doing he would strike out all possible chance of a question upon the part of the employer as to the ability of the operatives to give him the most and best that is in them or the machinery. This would also reflect from the employee that feeling of contentment which is so essential to the upkeep of a mill.

This adjustment of machinery unquestionably means in many cases a severe change from the regular routine of methods that we have been taught to follow, for can anyone bring to mind a mill that is so adjusted that is operates from day to day without friction of any kind? While it is possible for such a condition to exist, it is safe to say that one will have to look many an hour before he would be able to run across one.

Nevertheless, it can be done. Sizing can be made to run evenly from week to week without the slightest worry upon the part of anyone, and at the same time one can feel assured of its absolute correctness. Production can be assured by the application of correct speeds, roll settings, drafts, weights, etc. Humidity and temperature can be maintained that have the greatest beneficial effect upon the general output as well as the health of all concerned.

Poorly regulated mechanism is the source of many an unorganized textile establishment, and is usually the base of all worry and complaint. Flaky yarn, which is the determination of the strength of the finished yarn, is a thing that is wholly uncalled for and can be abolished entirely. Men may try to tell us that this condition is caused by the shorter fibers being left in the yarn, but that argument will not stand if long exposed to the sun's rays, for it can be eliminated.

Picking processes are in for a run for their money in the next few years, for do we not find a tremendous amount of our evils forming their early existence there? Then what about our carding machinery? Does it look as though these machines were giving us their utmost? And if we find that the slivers carry a quantity of neps, leaf and portions of seed, isn't it possible that adjustment can be made to eliminate this trouble and assure us of a clean, even, strong yarn that has everything in the world to do with maintaining a well kept organization?

Speeds and roll settings go hand in hand. Where speed is applied excessively and bad work appears—and it surely will appear under excessive speed—roll settings get the blame. Twist is called for to hold the yarn together under speed and roll settings get the blame. I have seen argument after argument and setting after setting thrashed out that finally ended in a condition where neither party could say which was the correct application, and the results would most certainly show it, when, in reality, it was speed.

Is it not true that many mills are changing from one lap weight to another from time to time, trying to overcome the trouble of thick and thin places in picker laps? Also, is it not true that tension is a bug-bear and in many instances a nightmare to many men, and do not all these things have a direct bearing upon the running condition of the work in every mill?

I speak of these things to bring to the reader's mind the things I think should be known by the leaders, and no doubt a great many of them are capable in their capacity and then again, how many of the essentials are known by the employee, upon whose very lips, a remedy rests, yet is never uttered. This is really an appeal for more co-operation.

As we drift about in our several vocations surveying the elements of construction and organization, our eyes may rest for an instant upon a phase of the game wherein sub-leaders become conspicuous. Our industry is subdivided and we find a great quantity of different departments. Does it ever occur to the one who has the responsibility of the entire organization that possibly it would be a good thing to educate the department leaders in the art of brotherhood and leadership? Not merely to say, "There is Tom Jones. He seems to be a very likely fellow; seems to know how to handle this department and has been with us for several years. We will give him a chance to show what he can do." Would it not be a greater act if Tom Jones was educated, not driven, into the finer arts; to teach him how to teach the worst and the best operatives beneath him; to teach him to remember that the time was when he himself was one of the rank and file of which he is about to become the leader, not the driver; that it is for him to know how to meet and elevate the operative beneath him in the acts and operations that the supreme leaders desire of them all; to show him that the general theme of it all is cooperation and not antagonism; to teach him the finer ways of man and nature and organization and co-partnership?

Does this not seem the better way for one to follow, the stepping stone for a better understanding between department leaders and employees? This method would be the basis of a friendship that would have no end of good for everyone. For have we not all seen instances where the department heads have been held responsible and have been seen to misconstrue their authority to the extent that many of the most efficient operatives have been driven from their work because of a misunderstanding, while if the art of brotherhood and authority were combined in the education of the leader, these things would never occur in hundreds of instances, and 'twould help most wonderfully in keeping those employees, who make the better men and women in the textile world, stay with the organization.

Such an understanding, of course, would mean a great deal of sound thinking upon the part of the one in charge, to organize his forces that each might get his education while at work, actually taking care of his own work and at the same time being taught the true road to a successful career and prosperity by a kind and firm executive hand.

It might be said that perhaps upon investigation we

would find that this method of personal education would first have to be applied to the chief himself. It isn't just the nice thought that should occur to us at this time, but with the omission of the slightest thought of sarcasm, the writer has seen many executives who, while straining every energy to accomplish certain standards for the welfare of humanity within their plants, had not the slightest thought of applying that principle within themselves.

One finds the easiest road to achievement along the lines of natural conditions. Of course we all must, in the course of our lives, adhere to all sorts of taskmasters and conform our lives to meet those conditions which are demanded by that type of executive. When one leader has to waste but little energy to accomplish the very best cooperation of the masses beneath him, others would have to sit up night and day to even bring themselves to believe that their success depends entirely upon such a method.

If, for instance, we will go back to our childhood days and recall our growth under the care and direction of our parents and after a careful summary, we should find a creepy thought that our Dad had been a man who had never a kind word for us, and that upon several occasions we had sought his help and instruction and received a stern rejoinder sounding something like this, "Haven't you thinking capacity of your own? Have I got to go out and do your work as well as my own? If so, I think it is about time you packed up your kit and got out. I'll get someone to come in here and help me who won't bother me every moment as you are doing."—would not such a reflection of the happiest days of life be stunted? Would not the general theme of life be darkened for us? Would not the enthusiasm of life be broken, as is the actual case in hundreds of the workers of our textile plants today? I'll say it would. But as an actual fact, this very same conversation is being carried on in many a textile plant this very day, figuratively, thus causing a shifting, dissatisfied, disgruntled mass of people that other bodies of men find it their duty to try to control by enacting laws and carefully regulated restrictions.

It is the easiest thing in the world to utter, and it is the uppermost command within the capacity of hundreds of department leaders and sub-department leaders. Of course, too, after a department boss has given such a command there is but one thing left for his next superior in command to do and that is to stand behind his attitude, thinking that it is the only means for a good organization, and standing a victim of circumstances, he too expresses his attitude upon the matter and doubly heaps the gloom upon the head of the once accepted and now rejected heart of the industry—the operative.

There are times when things look as though the once neighborly attitude had taken flight never to return. We find among the mills certain men who are assigned to certain labors, and never do we see one reaching out to assist another except when such an action has behind it the anticipation that he or she will be helped in return, or, in other words, no operative will attempt to assist another fellow operative today unless he receives compensation for such action. For instance, I have seen in years gone by an instance where a spinner had gotten into the depths of her labors perhaps because of poorly adjusted machinery, perhaps because of wrongly adjusted temperatures and humidities, perhaps because of a shortage of operatives for the time being and the work being assigned to her temporarily—anyway, she was "snowed under," so to speak, and I have seen many helping hands ready to assist her back upon the plane with the other spinners, thus maintaining her standard among her helpmates, and also bringing the general appearance of the room back to its normal level again.

That, as I have said, was in days gone by—what are the conditions now? If a spinner finds herself surrounded by the conditions spoken of, her first thought is of the deplorable condition into which her work has been thrown through some neglect somewhere along the line of operation, and the impulse is to leave and let the ones who were responsible for the condition straighten it out. Or perhaps she tries to arouse her self-control and await the department head, and in many cases she somehow will float through the entanglement alone. But, here is the point, never during the disentanglement do we find that old time neighborly spirit of one assisting another, unless he or she has been specifically assigned to that work, and then it is often done with a protest unless there is some additional compensation to go with it.

So it seems that the theme of the whole educational system has accomplished but one thing, and that is the desire for financial compensation. This would seem to apply to both officials and operatives; each has been eager to gain every penny possible—for what reason only each individual could explain. There has been a time in the past when each was content with a very small margin of profit. But of late, through some fantastic allurement, both have been carried away and beyond the danger-line and many a hard day's sledding has been experienced, and many another will be, before the normal plane is once more gained.

Tom (Mass.)

An Interesting Price Chart.

An interesting chart has been issued by Dwight P. Robinson & Co., Inc., engineers and constructors, New York, based on the figures of the Bureau of Labor Statistics index numbers of wholesale prices by groups of commodities and by months. This extends from 1914 to July 1, 1921, with the figures of 1913 set at 100 as a base.

From this chart, which covers eight principal industries, it is evident that price revisions in many industries have been arrested. During a recent week more price increases than decreases were noted which is the reverse of the situation which had existed for 56 consecutive weeks.

Particular attention is called to the curve for lumber and building materials which has begun to straighten out. Building materials have taken a deflation of 139 points from their peak as contrasted with the average deflation of all industries of 124 points in spite of a more than normal demand for construction material. For the month of January the contracts awarded were six per cent behind the January five-year average. For the period from January to July 1 they were 9½ per cent ahead of the January-to-July five-year average.

Of the products named in the chart, household furnishings goods is the highest, having dropped only 120 points; lumber and building materials comes next with a drop of 139 points; fuel and lighting have dropped almost 96 points to the index number of 188; cloth and clothing have dropped 176 points to an index number of 180 and have begun to rise slightly; chemicals and drugs have dropped 86 points to an index number of 166 and have straightened

out on that line; metals and metal products have fallen 125 points to an index number of 132; foods, etc., have fallen 155 points to 132; while farm products have come down from 246 to 113, a drop of 133 points.

The chart also shows a line of average for all commodities which indicates a general drop of 124 points with the line still on the downward trend.

Unfortunately, this chart is not of a size that could be reproduced in COTTON'S pages satisfactorily, but undoubtedly Dwight P. Robinson & Company would be glad to mail copies of this chart to interested readers.

As the railroads are now practically assured of government aid they may soon be expected to be in the market for materials and equipment they have long needed, and heavy railroad purchases would undoubtedly act as a strong tonic to the general business situation and would have a resultant effect upon prices. Also, the gradual understanding on the part of the general public that railroad rates and wages are still very much out of line with the general fall in other commodities and wages, will undoubtedly eventually bring to bear a pressure of public sentiment that will force these branches of this important industry to a much needed revision that will be at once reflected in the price of every commodity used by the people.

Notes About Men You Know.

JOHN G. MCFADDEN, for many years superintendent of the Natick (R. I.) Mills of B. B. & R. Knight, Inc., has resigned.

CALVIN E. SWEET, superintendent of the White Rock Mill of B. B. & R. Knight, Inc., and previously superintendent of the Centreville (R. I.) Mills of the same corporation, has been appointed superintendent of the Natick (R. I.) Mill to succeed Mr. McFadden. F. E. Binns, who has been overseer of carding at the White Rock Mill, has been made superintendent to succeed Mr. Sweet.

L. G. POTTER, president and treasurer of the Globe Manufacturing Company, and secretary of the Gaffney Mills, died recently, interment being held in Spartanburg, S. C.

LEON W. CAMPBELL, representing the Eclipse Textile Devices, Inc., of Elmira, N. Y., manufacturers of the Eclipse stop motion device for spinning frames, was a recent visitor to Atlanta and other southern points in the interest of his company.

CESARE PROTTO has been appointed assistant director of the sales division of the dyestuffs department of E. I. du Pont de Nemours & Company in place of E. V. Patterson, who has resigned. Robert S. Lunt has been appointed manager of the Boston office of the dyestuffs sales division with Charles H. Scott as assistant manager. These changes took effect August 1st.

H. H. BAKER, formerly general superintendent of the properties of Couch Mills, Inc., has accepted the position of superintendent of the Lauderdale Cotton Mills, Meridian, Miss., which was recently held by C. L. Upchurch.

J. O. WHITE, prominent cotton manufacturer of Gastonia, N. C., was instantly killed in an automobile accident at a recent date at Landrum, S. C. Mr. White was one of the pioneers in the textile industry of Gaston county, having been associated with J. D. Moore in the early days of mill building. From this beginning he enlarged his interests, and at the time of his death he was president and general manager of the Modena Mills, Gastonia, and the Morrowebb Mills, Dallas. In addition to his mill interests, Mr. White was prominent in banking and financial circles.

L. S. SASSOMAN has accepted the position of superintendent of the Lone Star Cotton Mills, at San Antonio, Texas, and has already begun his duties in that connection.

W. R. TANNER has been elected secretary of the Gaffney (S. C.) Manufacturing Co., to succeed L. G. Potter, deceased.

C. P. GRAY has resigned as superintendent of weaving, twisting and cloth room at the Bibb Manufacturing Co., Columbus, Ga., and has been succeeded by N. H. Murphy.

W. H. HARTLEY, recently overseer of spinning, spooling and twisting at the Hogansville (Ga.) Mfg. Co., has accepted the position of assistant superintendent at the Ozark (Ala.) Cotton Mills Co.

A New Washington Service.

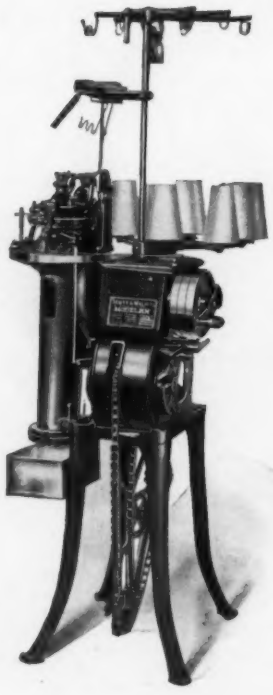
The Wilson-West Washington Special Service has been organized, with headquarters at the Munsey Building, Washington, D. C., by Rufus Wilson and others. The purpose of this service bureau will be to furnish to its members a digest of essential information concerning affairs at Washington, and will also furnish advice and assistance for use in the home offices of members in matters on which it is qualified and requested to advise and assist. It will also represent its members in important matters such as Federal taxation, features of tariff legislation, agency and general representation in connection with contracts and claims before all departments of the Government, information and assistance to groups representing business in matters connected with tariff, taxation and other questions; federal land matters and water power permits, passports, etc., and early and authoritative reports on labor matters; digests of decisions of the U. S. Supreme Court, the Court of Customs Appeals, and the numerous rulings of the Treasury department; bills introduced into Congress; committee hearings, etc.

Mr. Wilson, president of this new organization, is well known to textile manufacturers, having recently resigned as secretary of the National Association of Cotton Manufacturers. He has had an extended and varied business experience and enjoys a wide acquaintance. With him in this new work will be Henry L. West, and Alfred P. Perkins, secretary-treasurer and vice-president respectively, who are thoroughly qualified through experience for the work.

The National Aniline & Chemical Co., Inc., announces the production of a new direct blue, National Niagara Blue R W. Dyed direct on cotton this new product yields bright medium shades of blue of reddish tone, while by after-treating the direct dyeings, desirable indigo blue shades are obtained.

"Announcing an Old Loom with Some New Features" is the title of a folder recently issued by The Stafford Company of Reachville, Mass. It will not take more than 90 seconds to read it, yet it will post you on a very important development in the field of loom building.

KNITTING SECTION



NEW MODEL H-H

Producing Ribbed Top Half Hose Complete

Ribbed top made on two sets of needles.

Automatic transfer from ribbed stitch to plain.

Eliminating necessity of skilled help.

Saving of raveling waste which occurs when topped by hand.

Each stocking is dropped from the machine when finished.

Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.

Machine is fitted with five yarn fingers.

Provision is made for high spliced heel and double sole.

Provision is made for ring top and ring toe.

Needles without rivets or latches.

Speed of machine about the same as Model K.

Production about twelve stockings per hour on 3¾"-220 needles.

One operator can take care of the same number of machines as Model K.

The machine is built in all gauges.

ESTABLISHED 1865

Scott & Williams

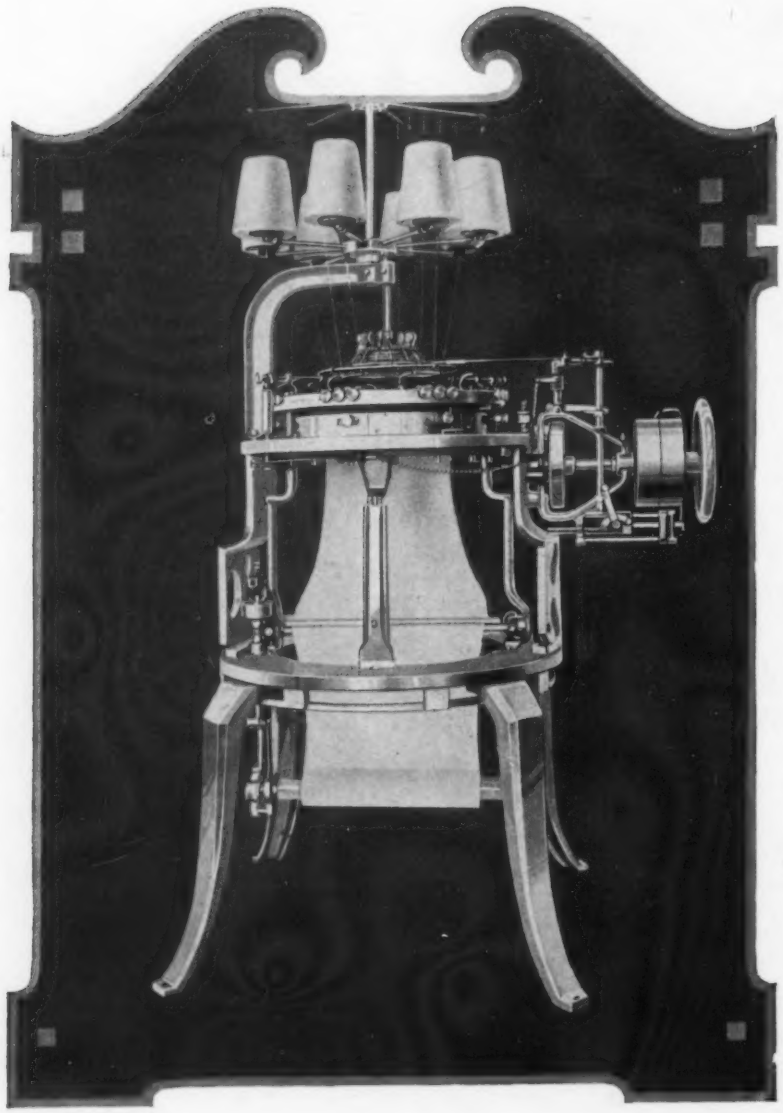
INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

Charlotte
1006 Realty Building

WILDMAN
THE WORLD'S STANDARD



Wildman Spring Needle Body Machine

Look at any type of Wildman Circular Knitting Machine! Note its perfect adjustment and alignment—the absolute accuracy with which it's made!

Every detail and device of Wildman Circular Knitting Machinery is designed and constructed with equal care and skill. Each has been developed through 32 years of study and specialized experience in producing the finest knitting machinery that can be made.

This is your assurance of increased efficiency and economy from the use of Wildman Circular Knitting Machinery.

On request we will send the "Wildman Spring Needle Body Machine Instruction Book" giving detailed illustrations and descriptions of every important part of the machine.

TRADE MFG MARK

WILDMAN MFG. CO.
NORRISTOWN, PA.

The Knit Goods Market

Gains were scored in the hosiery market in August, prices on a few lines were slightly advanced, none of the ground recovered in given lines was lost and, broadly speaking, a stronger undertone developed. The situation, however, continued spotty, mills here and there on high type as well as low end goods operating part time, with more machinery in operation than in July.

Confidence in underwear prices was indicated in considerable buying for next spring. Little business was done in heavy weights, but jobbers were calling for deliveries of their later purchases.

Sweaters did better in August than in the preceding month, and a fair degree of interest was shown in bathing suits when samples were exhibited and prices named for next year.

The outlook improved with the termination of several important strikes and the return of many men to employment. In practically every instance where unionism was the nub in textile strikes the employers were able to bring about a settlement with total elimination of the closed shop. With the final shaping of tariff and federal tax legislation and the termination of the controversy of the railroads with employees on the question of the manner of selecting committees of the latter for dealing with the roads on matters of wage and working conditions, there probably will come fresh stimulus, so that a fairly stable condition in knit goods seems imminent during the last quarter of the year, with activity in preparation for the holiday trade.

The market continues largely in the buyers' favor, of course, so far as most lines of cotton hosiery is concerned. The market of the near future is in the hands of manufacturers, many of whom, particularly in the cheaper division of product, appear to have been in competition on the question of losing prices. Taking misses' coarse ribs and boys' 42-ounce stockings, values were totally ignored, and while mills were selling at less than replacement cost, jobbers of the speculative type and others who are lacking in conscience when it comes to profit were having a harvest. One of the very large New York operators was a conspicuous offender, naming prices which possibly might have been justified had they come from a small, financially weak manufacturer in distress.

By the end of the month the market for misses' 28-ounce ribs had become steadier. It became apparent that, as neither jobber nor retailer had been buying except for very short time requirements, which necessarily were not pressing during the heated period, there would have to be considerable distribution for the fall trade. Prices showed a slight stiffening and manufacturers seemed to collect their senses and get away from the notion that it was necessary to give the goods away in order to move them.

A gratifying phase of the market situation, from the manufacturer's standpoint, lies in the fact there are no stocks of hosiery of moment in wholesale or retail stores. Cautious buying, with production being restricted, has worked toward a vacuum, which mills must fill. They will fill it with more profit to themselves if they continue the policy of curtailment—making as they sell, and keeping the buyer on the hunt for merchandise. It will be impossible to so manipulate the market that prices might be boosted. If anyone entertains that notion he might as well get rid of it now as later. Prices will not go high enough to provide for normal profits, but they can be put on a remunerative level if mills will follow the example of jobbers. It may be difficult for manufacturers to operate on the plane of the distributors, but they are solving the problem, having had their lesson in heavy losses, and will find a means of keeping cost down to a level at which goods will move freely.

Cheap cotton hosiery for men and women came into better demand in August. Some of the larger jobbers admit they are selling heavily of these lines, and it is observed that a few mills which make only low end goods have found it necessary to increase their equipment. One of the southern mills recently added a number of loopers, not to replace others, but for obtaining larger production. The mill that can maintain a good flow of production and maintain practically normal output per operative, and thus bring overhead charges down to where they belong, can sell cheap hosiery on the present market and show a balance on the right side of the ledger page.

The price tendency in low end cotton hosiery is perhaps indicated in a recent advance of five cents a dozen for cut-toe automatic top 176 needle socks, to 80 cents. They had sold as low as 72½ from one agency at 346 Broadway, New York, representing several mills. Good full seamless 176 needle socks are bringing 90 cents, which also is an improvement over prices which have been heard in the last month or two.

A commission man several weeks ago was in the market for 144 needle socks, for which he offered 77½ cents. He had been on the road and sold freely at that price, assuming there would be no difficulty in getting them, subject to a broker's commission of seven per cent. How he made out has not been ascertained, but it is known that several mills rejected the business which the commission man offered them.

Several mills in North Carolina declined orders for cotton-top mercerized half hose at $1.65 a dozen. They were wanted for delivery inside of 30 days, a condition which the mills could not meet. It frequently happens that an order may be lost to a manufacturer because he is sold ahead and the buyer wants practically spot delivery. This is an encouraging situation, which promises to improve as mills more generally adapt output to actual demand.

For a time half hose was so draggy as a class it might have been assumed a large part of the male population was barefoot. But here again demand seems to have caught up, for the socks are being taken in better quantity. An all-mercerized several weeks ago was advanced to $1.85 a dozen from $1.75, a price at which for a time it did not appear attractive to buyers. A branded line of mercerized half hose was advanced from $2.10 to $2.25.

The tendency in relation to women's standard mercerized also is upward, and jobbers view with suspicion lines of 220 needle offered at less than $2.50, a price that is entirely too low, with ply mercerized combed peeler 60s costing mills $1.05 a pound and 40s but 10 cents less. A Pennsylvania manufacturer maintains a price of $3.25 for

women's 240 needle mercerized, and $2.75 for a stocking of the same gauge and identical in all respects with that at the higher price, except as to yarn and finish. He finds the better demand is for the higher priced stocking, this conforming to the commonly accepted theory that the trend is toward better-made hosiery, whether of the low-end or high grade lines. In fact, some mills have discarded altogether the trashy by comparison. It is observed, however, that there is room for improvement in seamless silk hosiery, more notably women's.

Good mock fashion seamless silk boot stockings are being sold at $9.50 to $10.00 a dozen by mills in good standing with the larger jobbing houses. There are lines that are offered at $8 to $8.50, for 10 thread, but in these something seems to be lacking in the knitting and finish. They probably are worth all they fetch, but they serve to condemn seamless as a class in comparison with the full fashioned, which will be in short supply for the remainder of the year.

Full fashioned stockings for women have attained a degree of popularity never reached heretofore. The fact they were scarce whetted the appetite for them. More women are wearing them since all the women have had extended to them the voting privilege. There is more of the woman club life; women are playing an active part in politics; they are doing jury duty. The broadening of woman's sphere has broadened the use of silk hosiery, and it is a weakness of woman that nothing short of the fashioned is good enough. As a matter of fact, the seamless silk now is made to so closely imitate the fashioned that many women are wearing it, but happy in the belief their ankles are encased in the fashioned. Some dealers exact the same price for a seamless stocking costing $10 a dozen as for a full fashioned which sell at mills at $14 to $18. The makers of the seamless—some of them—are missing an opportunity in not making them better.

"Will full fashioned silk hosiery production be overdone?" is a question frequently heard. There will be no excess production this year. The shortage is due, of course, to the fact 16 full fashioned mills were idle seven months by reason of a strike of organized mill operatives. During July and August some of the idle mills in Philadelphia had resumed in part, with the use of raw help recruited from outside the union and trained, and there now is probably the equivalent of a 25 per cent production by the fourteen mills. The big full fashioned mill at Fort Wayne, Ind., which was one of those affected by the strike, is doing even better than the Philadelphia mills in the matter of replacing strikers, and by next month probably will be operating at machine capacity. Progress is being made also by the mills of Julius Kayser & Co. in circumventing the strikers. Thus there is being produced much more full fashioned hosiery than three months ago, aside from the fact that since January 1st several hundred full fashioned machines have been bought and many of them installed and in operation. The increase in output from the new machines compensates in great measure for the production that was lost by strikes.

There were sold this year to August 31st 320 full fashioned hosiery machines. Deliveries have been slow, but doubtless 250 of these machines now are turning off stockings. Then there must be taken into the inventory fifty or more machines of foreign build which reached mills in this country after many months of delay due to interruption of ocean transportation.

The truly big selling of hosiery during the latter part of July and throughout most of August was of infants roll top socks of all mercerized, mainly, with large sales also of the mercerized leg and combed yarn top. Prices ranged from $1.75 up to $2 a dozen, and a mill making a line at the latter price sold up in less than two weeks for 60,000 more dozens than were sold during four months of 1920. Production last year was severely restricted and this year dealers were without adequate stocks. They bought heavily for fall, and now have bought even more heavily for next spring. There was a confidence among them that mill prices had gone to the bottom. In fact, the price on one line was advanced after the July opening and the manufacturer of another contemplated an upward revision after mercerized yarns had materially stiffened.

The socks this year came out in a greater variety of color striping, and one mill improved on the roll top. An important New York hosiery operator predicts an inundation of infants' socks from Germany. The Germans, he says, produce a sock that to this time has not been matched in this country, and will flood the market, at prices with which domestic manufacturers cannot compete, with tariff schedules as they stand in the Fordney bill. German colors already have been matched, one mercerizing establishment in particular having obtained samples of the imported socks and supplied its patrons with sample skeins of yarn dyed in the newer German shades.

There is too much variation in prices of combed yarn hosiery. A Pennsylvania mill is sold a month or two ahead of half hose at $1.65 for double sole. Another manufacturer asks only $1.50, which is the price the Pennsylvania mill scores for its single sole. The latter is quoted in some quarters at $1.25 and even lower, for which price there would seem to be no excuse.

Some makers of heather cotton half hose find a ready sale, while others are looking for business. A wool heather sock with machine silk clocking, to retail at a dollar a pair, is reported finding a good outlet. Cheap heathers are one line in which there is strong possibility of overproduction. Heathers for men are only slightly removed from the innovation stage. They may or may not gain in popularity.

Readjustment seems to have proceeded further in hosiery than underwear, due, probably, to the fact that, except as to wool lines, hosiery has been selling for 30 to 60 days, whereas underwear purchasing is by seasons. Light weight underwear is in a better position than winter garments, so far as readjustment to lower values is concerned. What the former underwent during the current season remains to be undergone in the coming winter as to heavy weights.

Jobbers have made a clean-up of stocks of light weight underwear, which accounts for the fact some are buying for next spring. They have practically no carryover; in fact some did not have enough to see them through the season. They took a chance on short supplies rather than having any to carry into next year. This is having a wholesome effect on the market, which in one respect is cleared for operations on a more nearly normal basis.

By a sort of gentlemen's agreement among a few jobbers and still fewer manufacturers, August 15 was designated as the opening date for spring underwear. The

understanding was ignored to some extent by manufacturers and distributors, and buying started in July, being continued throughout July. This refers more particularly to women's garments, and is not to be interpreted as meaning that jobbers generally are buying. But there has been enough of contracting to establish a confidence that a few months ago was lacking.

Subsequent to arriving at the understanding prices were to be named on August 15, manufacturers of men's bal briggan suits and shirts and drawers met and decided that a week earlier ought to be an opportune time for going to the trade. Accordingly, lines were shown on the eighth of the month. As has been usual in the last two years, buyers were absent on the opening day.

It was assumed that 4¼-pound shirts and drawers would be priced $3 a dozen. One or two manufacturers, asserting their product could not compete at that price, fixed on $2.87½. Before the opening day had waned one of these mills came out at $2.75, and later dropped to $2.62½ for quantity orders. This was sufficient to disturb lukewarm buyers, and the day closed without an opening except in theory. Buyers reasoned that as the $2.87½ garment had dropped to $2.75 in a half-day the $3 price would decline to where the lower price garment had started.

Manufacturers made the same blunder that was made in March, when winter lines were opened. Buyers did not flock to market on that occasion, and for several days prices were being revised downward in several mill offices, and it was some little time before there was an approach to stability. From the standpoint of manufacturers of men's knitted athletic suits it is unfortunate there should have been any disturbance of the plans as to next spring.

One order booked in August by a mill making men's light weight garments amounted to approximately $200,000—and prices not guaranteed against a decline, fear of which is not entertained by seller or buyer. The mill opened its line a month or more before the day set for showing samples and naming prices and has been writing orders and entering their acceptance ever since.

It has become a question in the trade whether, in the present market conditions, an opening as it was known under prewar normal conditions is essential for starting a season's business. A manufacturer holding the negative view takes the position that the time to sell a commodity is when buyers are ready to purchase; that instead of sitting in an office and waiting for buyers to come to market it is more profitable to go out among them. That is what the salesmen for this manufacturer have been doing for six weeks. The boast is made that they have sold more dozens than the representatives of any three mills will sell in the next month if they stick to the swivel chairs and sample counters.

Nainsook suits for men have been so popularized that there has been a sharp drop in demand for the knitted. Recently there was planned a campaign for reinstating the knitted suits, and no little publicity on the claim of their superiority as a yielding, absorbent garment was obtained. Nainsook manufacturers were quick to anticipate inroads on the woven suit, and came out earlier than originally was intended, this probably forcing the earlier opening of the bal briggans. Before matters had gone far, nainsook prices, to use the language of an extensive operator, were "shot to pieces," and it is stated one manufacturer booked jobbers' orders totaling 400 cases in one day in the Philadelphia territory.

There is little doubt nainsook underwear was popularized by the extensive and intensive advertising of the B. V. D., which, while of woven cloth largely, possesses patented features not present in the run-of-mill nainsook. With some careless observers practically anything on the order of a nainsook union or athletic suit was looked on as a B. V. D. Thus the unidentified profited by the advertising of the branded. Now a mill has brought out a 50-50 suit, the upper part being made of knitted fabric and the lower of nainsook.

The P. H. Hanes Knitting Co., Winston-Salem, N. C., has brought out a line of boys' and youths' nainsook union suits, which are being offered to the trade for spring, in conjunction with the company's nainsook athletic suits. The latter were added about a year ago to the mill's lines of men's cotton ribbed underwear.

Most of the Pennsylvania manufacturers of women's light weight underwear are comfortably situated as to business. Some have orders which will keep them engaged for the remainder of this year and enough in sight to assure their mills steady operation until early next spring.

The tardiness of jobbers in contracting for their needs for the season which now is about at the tail end operated to the advantage of the direct-to-retailer mills. At least two of the larger in this class sold from 20,000 to 25,000 more dozens for the current season than they sold in 1920. These same manufacturers find nothing in their Fall business to cause any excitement. One, to August 15, had sold about 50 per cent of the total winter sales last year, but had sold to only about 50 per cent of the mill's regular patrons.

Retailers mills' prices of winter underwear show a drop of about 50 per cent of last year's values. Goods for next spring will show no such decline from the current season, the latter not having been bought until the early part of 1921, when yarn and labor costs had gotten down to almost present levels. But some of the retailers, it is reported, aim to create the impression next summer that prices did radically decline toward cheaper garments. At the lower price they purpose selling less quality.

This is regarded a serious blunder. It is admitted that some persons may be superlatively exacting when it comes to selecting hosiery and yet be totally indifferent as to their undergarments. The short skirt leaves three-fourths of the stocking exposed, but the low cut bodice still hides the underwear. As to the latter, the logical trend is toward the really good, and while the trashy may find a market so long as it is necessary to economize in some directions in order to make a display of extravagance in others, it never will hold a place where the better has been given preference. Several manufacturers taking note of the attitude of dealers have substituted garments of lighter weight, and it is commonly understood the public is agreeable to having five to ten per cent of the weight of a union suit lopped off. It need not be surprising if, with many men, a 14-pound union suit take the place of the popular 16-pound garment.

The chief interest of jobbers in heavy weight underwear is in delivery of purchases made in May and June. Even the earlier buying was done late, and mills were in no hurry about starting machinery that had been idle several months. The late buying found many manufacturers in

no position to ship out just when jobbers wanted the goods to come forward, and now that Fall is only a month ahead, distributors are beginning to show some concern.

Leading jobbers have admitted that all the underwear in stock and on order will fall short of a severe winter's needs. But they are not going to stock up either from philanthropic motives or as a business proposition. The average jobber would rather suffer a loss of sales of fifty cases of heavy underwear than have five left to be carried over for the succeeding winter. He is obligating himself for nothing that he can escape buying, and has a suspicion that underwear sold by manufacturers next year will cost him less than what he paid this year. The result of this, while for the moment not contributing to the comfort of the manufacturer, should work toward that steadiness which has been attained in light weight underwear and, to a great extent, in hosiery.

In the last several weeks there has been a complete about-face in the attitude of many jobbers toward winter underwear. One southern mill, referring to a quite recent sale, speaks in terms of car lots instead of dozens, the order amounting in fact to two carloads. Another manufacturer booked an order from a jobber about midway between North and South for 250 cases. This was more than the jobber's early-season order called for. A central west mill has booked its fourth repeat order from one jobber. This is another of the mills which does not observe seasonal openings. Its lines for next winter were being sold last February, one month before manufacturers as a body showed samples and named prices.

Knit goods jobbers have been over-cautious, is the opinion of many persons in the trade. Jobbers have complained that the stumbling block to normal buying by wholesalers was the attitude of the retailers, who have been represented as taking only dozens as against cases normally, and insisting on unreasonable sales terms and guarantee of prices. Yet mills selling to retailers direct, both hosiery and underwear, have had a heavier volume of business, relatively, than mills selling to jobbers. Retailer mills have been and are buying from jobber mills. Some are sold so far ahead that they are calling on customers for an outline of their prospective needs for the next two months. And it develops that with the retailer mills more operatives are employed and for more hours per week than in the jobber mills. The July deliveries of a few of the retailer mills were not completed until late in August, and one can be mentioned which has sold up for the remainder of the year of full fashioned silk half hose, at $8.50 a dozen. While retailer mills may enjoy an advantage in selling only branded lines, many jobbers have brands of their own under which they sell. It would appear the retailer has not been the terror the jobber has painted him, and that the jobber might have fared better in volume of business had he not carried conservatism to the extreme.

The Santa Fe Railroad has been carrying on a "better packing" movement among its patrons, and has published some timely slogans, among which are the following:

"Packages properly packed, marked and loaded are halfway there."

"A good package delivers the goods."

"Read, practice and preach the gospel of a good package and proper handling."

Branded Versus Unbranded Goods.

A department head in a nationally known commission house operating extensively in knitted goods and silk, cotton and woolen cloths makes the bald statement that unidentified fabrics in the piece or in the manufactured product will have a struggle in the markets of the future. He predicates this largely on the wide-open field for branded and ticketed sheetings, muslins and ginghams and the commonly accepted fact that direct-to-retailer knitting mills selling under their well established brands are enjoying a relatively greater volume of business than those mills distributing through wholesalers. The brands, he contends, have put these makers of knitted goods in the class of manufacturers whose brands of woven goods have become household words, assuming there has been merit behind the trade marks.

The notion that the unidentified article will not command so good a market as the trademarked is scoffed at by several manufacturers, who cite the fact their products are sold widely by leading jobbers, although there is no mark or ticket to indicate where or by whom they were made. In support of the view of these manufacturers there is mentioned a hosiery mill which three years ago was unknown, and whose product now is and for almost two years has been sold to nearly all of the larger jobbing houses. This establishment was manned from the start by executives experienced in the manufacture of hosiery and enjoying a wide acquaintance in the jobbing trade. Some of the larger of the knit goods manufacturers, it is shown, started in only a small way and never employed a trademark or distinguishing word.

The sales manager for a manufacturing establishment capitalized at several million dollars, whose experience in selling to the jobbing trade covers both the branded and the unidentified, inclines to the latter as the better proposition. He recalls that some years ago when he was exploiting a trademarked line he had difficulty in interesting the larger jobbers in the Chicago territory. They affected to know nothing of it. He was dumbfounded, but to prove his case to the jobbers he called into service a recognized advertising expert. A tour of the jobbers was made, with the result it was found a mill line of knit goods unbranded was more generally known than the trademarked line in question. The former was the product of what now is a large unit in the knitting industry. It was put up in paper boxes of a distinctive type; that was all. The branded line was extensively advertised and still is among the better known of its class.

The critical buyer in a retail store, it is pointed out, generally speaking, is more interested in quality than trademarks, but, where a trademarked article has proved its merit, that buyer may purchase brand rather than fabric. A woman might call for "Fruit of the Loom," "Lonsdale," "Pepperel," "Red Seal," for example, without giving further thought to what she was buying. Few brands of knitted goods have been known for so long a time, yet a man will ask for any one of a number of well known brands of stockings or underwear and give his purchase no particular attention except to see that the salesman is wrapping the proper size, and it has been shown that against a branded article of a specific type will he promote the sales of the unbranded similar in structure. A dealer who does not have B. V. D. in stock may hand out

to a customer a plain nainsook, and usually it goes, unless the salesman has misjudged his customer. In the minds of many persons, it was found on inquiry, a nainsook athletic suit for men is linked with B. V. D., although minus the distinctive features of the latter.

While every jobber of dry goods knows that his stock would not be complete without the well known branded and ticketed cloths of commerce, the larger among them, it is stated in the trade, handle certain brands of other lines simply because they must. "There's not enough in them," a jobber says, "if they are sold to all jobbers, as in knitted goods." the small community jobber, it is pointed out, has a very great advantage over the metropolitan house whose salesmen visit the community, in handling branded knit goods. The visiting salesman, it is held, cannot compete in the branded with the local jobber unless by offering a price concession, and this, it is held, usually comes from the smaller houses. Thus, the territory for branded goods, aside from some which have been nationally known for many years, is restricted, so far as the larger jobbers are concerned, and they are not partial to meeting the reductions frequently named by establishments too small to compete except by offering concessions. The favorite brand with a jobber, speaking generally, is one which he himself controls. The opposite is true in relation to the small or obscure jobber.

A distributor of the smaller caliber and restricted acquaintance in the retail trade realizes that his brand or trademark would carry no weight. He, therefore, seeks the branded, from which it is deduced that brands do sell goods—and it must be admitted that a brand, to constitute a selling point, must be advertised.

Mill reputation may be as good as the most widely known trademark, and accounts are freely offered to a number of manufacturers whose mill name is well and favorably known by all classes of distributors. For example, in relation to a mill line of silk half hose, a salesman commands instant respect for the sock when he tells his customer, "This stocking is made by the So-and-So mill." That jobber might not be able to go very far with his customer if he could not mention a brand or the name of the maker. After all is said, it will not be denied by manufacturers who have puzzled over the trademark question that unless brand and quality are linked, brand will have a short and unprofitable existence.

One objection of some manufacturers to the use of trademarks is the possibility of the brand putting the goods in what is regarded undesirable company. During a period of steady radical price declines and "dumping" of merchandise by second hands at far less than mill value very high class goods are liable to find their way into establishments where, ordinarily, only the very cheap is to be found. This is something the manufacturer cannot prevent, when an overloaded distributor in financial distress is the medium through which the product came to be displayed in the show window of some store where it would not be found in normal times. The trashy is not exalted, in the mind of the household buyer, by the presence of the quality article of popular brand, while the latter may be viewed by jobbers as a class as having been cheapened. A few of the large department stores are said to display no branded goods, with a number of exceptions, and use them only for the purpose of "special" sales.

It is easily possible, say some manufacturers, to put the cost of branding into the goods and command as wide and profitable market as for the best of the trademarked. Admitting that the mills selling direct to the retail trade almost without exception employ brands and that they are busier by far than the average mill selling to jobbers, this does not prove that brand is the prime factor in the relative volume of business, for many jobbers distribute under their own brands, yet they are not selling as many dozens of hosiery or of underwear per retailer as are the mills which sell to the retailer.

Jobbers, a direct-to-retailer mill executive says, have permitted themselves to be made bankers for the dealers to a far greater extent than manufacturers are willing to constitute themselves bankers for the jobbers. They yield to demands for unreasonable terms, it was held, and have permitted cancellation of orders and return of merchandise until the retailer has come to feel that even the jobber selling under his own trademarks cannot dictate terms.

The pros and cons on the subject of branding knitted goods are treated in The Knit Goods Bulletin of the National Association of Hosiery and Underwear Manufacturers, and the publication confesses that, after exhaustive questioning of those favoring and those opposed it must occupy neutral ground, holding, however, that merit will sell the unidentified, while brands will not sell goods from which merit is absent, and that the unbranded can be sold by mills direct to retailers. At least two mills selling retailers and employing no trademark are sold up for the remainder of the year of full fashioned silk half hose. The Interwoven Stocking Company, also selling the retail trade, branded lines only, some weeks ago announced it could accept no business for delivery during August. The Knoxville (Tenn.) Knitting Mills Co. is sold ahead on several of its lines for all branded 30 to 60 days. The unbranded mercerized hosiery of a Pennsylvania mill going to jobbers is selling in only moderate quantities, the mill operating not more than two-thirds time. Of two lines identical except as to yarn and finish, the better, at $3.50, is being taken in preference to the other at $2.75. Retailer mills are buying from jobber mills, having the goods put up under their own marks. They are assumed to be getting precisely the quality that goes into the goods of the jobber, yet the latter is permitting a part of the production to drift to his competitor—the mill that sells to his customer. The only difference is in the employment or non-employment of a brand.

Executive Board of National Knitters Association Holds Meeting.

A referendum vote of the membership of the National Association of Hosiery and Underwear Manufacturers shows a preponderating sentiment in favor of monthly reports to the Department of Commerce covering actual production, per centum of production in relation to mill capacity, and finished product remaining unsold at the end of the month, but a greater preponderance of opposition in the event like reports be not submitted by spinners of yarn and wholesalers, dry goods retailers and the department stores. The following questions were submitted to the members:

"Would you be in favor of reporting (the statistics mentioned) if spinners and dealers reported?"

"Would you be in favor of reporting if spinners and dealers did not report?"

ALWAYS FIRST WITH — THE — LATEST

BANNER

ALWAYS FIRST WITH — THE — LATEST

FULL AUTOMATIC

HOSIERY MACHINES

SIMPLICITY — SPEED — PRODUCTION — QUALITY

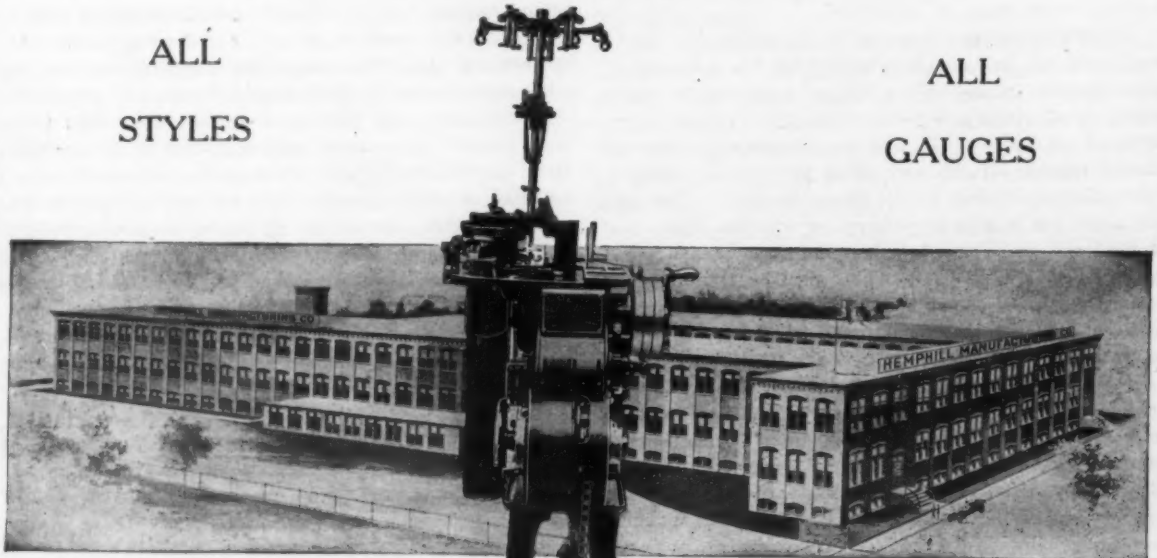
Four important things to consider when buying Hosiery Machinery.

ALL PARTS ACCESSIBLE FROM FRONT OF MACHINE

Write for descriptive catalog

ALL STYLES

ALL GAUGES



HEMPHILL COMPANY

Main Office and Factory,

Pawtucket, Rhode Island.

Southern Office and Show Rooms
912-913 James Bldg., Chattanooga, Tenn.

Philadelphia Office and Showrooms, Rooms 205, 209, 210, Colonial Trust Company Bldg., 13th and Market Sts., Philadelphia, Pa.

The vote on the first question was 58 in favor to 25 opposed.

On the second question the vote was five in favor to 74 opposed.

Conformably with the showing of the referendum, the executive board of the Association at its annual meeting on July 30 adopted a resolution favoring reports to the Department of Commerce provided reports of similar import be filed by spinners and dealers, and adopted another resolution recommending that the Association gather such statistics as had been asked for by Secretary Hoover and distribute summarized reports among the members filing reports of their production and unsold finished product.

The Board also urged the defeat of the French-Capper bill, which would require that woven cloth made wholly or in part of wool have stamped on every yard the per centum of "virgin wool," "shoddy" and cotton and silk. By cotton, as also by wool would be meant fibre which had not been reworked. It was pointed out that cloth of reworked wool and reworked cotton, which under the provisions of the bill would have to be described as shoddy, might in fact be superior to cloth made from low class virgin wool—that is, wool that had not been reworked. The boast has been made in Washington by friends of the bill that if it become a law its principles are to be applied to knitted fabric.

Vigorous opposition to the reinstating of the embargo provision in the dye schedule of the Fordney tariff bill was voiced by the Executive Board.

D. L. Galbraith, American Textiles, Inc., Bay City, Mich., vice president of the association, was appointed chairman of a committee of five to arrange for the 1922 exhibition of the Association. The remainder of the committee membership will be divided equally between manufacturer members and exhibitor members of the Association, the first to be chosen from the Active class and the latter from the Associate.

The southern members of the Executive Board at the meeting were W. B. Davis, W. B. Davis & Son, Fort Payne, Ala.; T. H. Johnston, Knoxville, (Tenn.) Knitting Mills Co., and F. L. Miller, United Hosiery Mills Corporation, Chattanooga, Tenn.

Kier Boiling.

The whiteness and softness of bleached and finished fabrics reflect the character of the ingredients employed in kier boiling and the method with which they are employed. Therefore, it is generally conceded by authorities that kier boiling in any bleachery, regardless of its capacity, has a direct bearing upon the quality and cost of the finished fabric.

The textile laboratory of L. Sonneborn Sons, Inc., cognizant of the vital importance of the kier boiling process and its relation to the subsequent processes has devoted much time and effort to the development of a new product known as Sonolene "C."

Sonolene "C," it is claimed, is a very powerful, yet non-injurious kier boil oil, consisting of chemicals scientifically combined, which is clear soluble in water—either cold or warm—an indication of its penetrating properties. It is also said to have the added advantage of not forming a flocculent precipitate even with the hardest water.

The distinctive chemical and physical characteristics claimed for this product are that it attacks more forcibly the natural cotton wax, resinous matter, stains, etc., than either alkali, soap or a combination of either. Its action upon the cotton fiber is to not only readily emulsify and thoroughly remove all natural and foreign matter detrimental to the finished fabric, but at the same time, preserve the fiber itself, increasing its tensile strength.

The Knit Goods Industry.

A preliminary statement of the 1920 census of manufactures with reference to the knit goods manufacturing industry has been prepared by the Bureau of the Census of the Department of Commerce. It consists of a detailed statement of the quantities and values of the various products manufactured during the year of 1919, and gives a comparison of these amounts with those of 1914. The knit goods industry, as presented in this report, includes textile mills engaged primarily in knitting. There are no confines as to the kind of materials used or character of goods produced.

The report shows that in 1919, the knit goods industry included 2,049 establishments, located in 32 states, whose production reached a value of $713,140,000. The number of establishments in 1914 was 1,622, and the value of the products manufactured was $258,913,000.

Of the 32 states represented in the report for 1919, 17 states each reported over $5,000,000 in value of products, the aggregate total of these 17 states amounting to $686,459,000, or 96.3 per cent of the total value of products for the industry. New York leads the list in value of products by states, with a value of $195,377,000; there were 683 establishments in this state. Pennsylvania, with 606 establishments, is second with $188,261,000. Massachusetts comes third with 77 establishments producing $52,424,000 worth of materials; and Wisconsin, with a value of $40,778,000 and 72 units, is fourth. The thirteen other states which reported products worth more than $5,000,000, listed in the order of the value of these products, are as follows: Tennessee, $32,952,000, with 61 establishments; North Carolina, $29,834,000 with 121; New Jersey, $23,853,000 with 90; Illinois, $20,460,000 with 58; Ohio, $18,779,000 with 34; Minnesota, $13,985,000 with 16 establishments, Georgia, $12,567,000 with 28; Michigan, $12,039,000 with 31; Rhode Island, $11,936,000 and 26 establishments; Indiana, $9,802,000 with 8; Connecticut, 21 establishments and $9,332,000; New Hampshire, $9,015,000 with 16; and Vermont, $5,063,000 with 7 establishments.

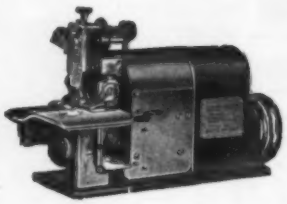
More than one-half of the total value of products for the industry, in the census for 1919, was reported by two states, New York and Pennsylvania, representing 27.4 and 26.4 per cent, respectively.

Hosiery was the principal character of knit goods reported for the United States. This represented 43 per cent of the total value of products in 1919, which increased from 37.9 per cent in 1914. There were 84,624,000 dozen pairs produced in 1919, which showed an increase of 12.6 per cent over the production five years previous—75,165,000 dozen pairs.

Cotton hosiery predominated in quantity with 60,613,000 dozen pairs in 1919, or 71.6 per cent of the total dozen pairs reported, and 61,409,000 dozen pairs in 1914, which was 81.7 per cent of the total in 1914. Cotton hosiery in itself, however, showed a decrease of 1.3 per cent since

MERROWING

ESTABLISHED 1838
MAKERS OF



THE MERROW HIGH SPEED

OVERSEAMING; OVEREDGING
AND SHELL STITCH MACHINES

MERROWISE

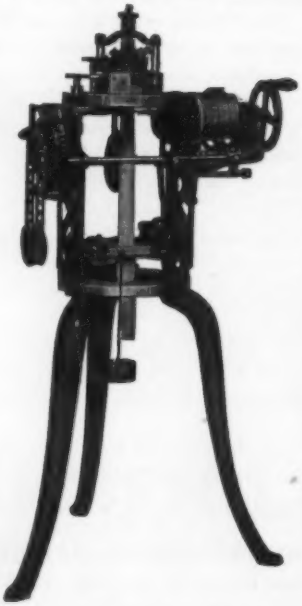
FOR EFFICIENCY
IT MEANS

MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

16 LAUREL ST., HARTFORD, CONN., U. S. A.

H. BRINTON CO.



Builders of

Circular
Knitting
Machinery

of every kind for
every purpose

Hosiery Ribbers
with the very
latest attachments

Full Automatic
Hosiery Footers

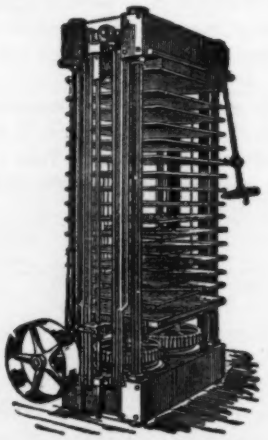
Body Machines

Sleevers, Etc.
for Underwear,
Sweaters,
Toques, etc.

Write for Catalog, Prices and Samples

213-217 Race Street, PHILADELPHIA, PA.

Canadian Agent: Hartley Kay, Ltd., Georgetown, Ont.



RELIANCE

Hot Plate Screw Press
FOR
Hosiery and Underwear

Write for Catalog and Prices

Reliance Machine Works
FRANKFORD, PHILA.

the previous census, dropping from 61,409,000 dozen pairs in 1914 to 60,613,000 dozen pairs in 1919.

Silk-mixed hosiery was second in importance, with 16.5 per cent of the total number of dozen pairs for 1919. It showed, however, a gain of 177.1 per cent during the five-year period—in 1919 the production was 13,996,000 dozen pairs against 5,051,000 in 1914.

The value of the underwear produced in 1919 was $204,713,000, or 28.7 per cent of the total value for the industry. In 1914, the value was $93,119,000, or 36 per cent of the total. The decrease in the quantity of underwear produced from 1914 to 1919 was 5.4 per cent, the drop being from 28,032,000 dozen in 1914 to the 1919 production of 26,517,000 dozen. The increase in the popularity of the union suit is borne out in the fact that there was a 46.8 per cent increase in the number of dozen suits reported in 1919 against a decrease in the quantity of separate shirts and drawers of 21 per cent reported at the same census.

Fancy knit goods represented 16 per cent of the total value of products for the industry in 1919 and 17.9 per cent in 1914. Sweaters was the most important item reported within this group with 51.2 per cent in 1919.

The largest increase of any group of knit goods in quantity of production was shown by knitted cloth, with 253.5 per cent more square yards in 1919 than in 1914. In 1919 this group formed 8.3 per cent of the total value reported for the industry; in 1914, 2.6 per cent.

Thread and yarn for sale, of which cotton is the principal kind, formed 1.6 per cent of the total value of products for the industry both in 1919 and in 1914, and showed an increase for the five-year period of 5.4 per cent in quantity, from 17,053,000 pounds in 1914 to 17,493,000 pounds in 1919.

Among the Knitting Mills.

The Berman Bros. & Lindeman Company has been incorporated at Brooklyn, N. Y., by Israel Berman and Michael Berman with a capital of $30,000. The new company succeeds the Simon Halperin Company, manufacturers of knit goods. The new organization announces that it will specialize in the manufacture of sweaters, mufflers and ties.

The Bertha Hosiery Mills, Mohnton, Pa., have been incorporated by Harry and Max Fischer, of Reading, Pa., and M. J. Muchnick, of Philadelphia. This will be a new hosiery and underwear knitting mill with a capital of $100,000.

The Vaughan Knitting Co., Pottstown, Pa., will build an addition to its mill, it is reported.

The Renfro Hosiery Mills Company has been incorporated at Mt. Airy, N. C., with a capital stock of $50,000 by W. G. Sydnor, president, and T. C. Barber, secretary, to take over the branch plant of the Mayo Mill at that place. This plant was opened up during the war period to manufacture hosiery and finish underwear. The underwear finishing machinery was recently moved from Mt. Airy, and the organization was considering the moving of the entire plant, but business men of Mt. Airy, not willing to let the enterprise be taken from the town, bought out the interests of the Mayo Mills Company for a reported consideration of $40,000. The present operative and office force will be retained. It is stated that the new company will erect a new building and install 128 new knitting machines.

The Sunbeam Knitting Mills, New York City, have been organized to manufacture hosiery, underwear and other knit goods. The incorporators are David L. Smollett, Joseph H. Lapin, of Brooklyn, and Gertrude D. Frye, 108 West 103rd St., New York City.

The new plant of the Sylva Knitting Co., at West Reading, Pa., has begun operations with 100 employees. The product will be women's underwear in both summer and winter weights. This mill is a branch of the Sylva Knitting Co., at Hamburg, Pa., which started operations about two years ago.

It is rumored that the May Hosiery Mills, of Nashville, Tenn., will erect another large knitting plant at that place.

The Northampton Hosiery Co., Northampton, Mass., has been incorporated to manufacture and deal in hosiery and knitted goods. The capital is $500,000. The organizers are R. Hodder, W. C. Van Brunt, and George A. Bacon.

The Lycoming Knitting Company has just been incorporated at Dover, Del., to manufacture hosiery. S. E. Dill, M. A. Bruce and C. H. Maxwell, all of Wilmington, Del., are the incorporators. The authorized capital stock is $100,000.

It was recently announced that the firms of William F. Taubel, Inc., and of the Scott Kitzmiller Co., Inc., two of the larger hosiery manufacturing concerns in the country, have been merged into one organization under the firm name of Taubel-Scott-Kitzmiller Co., Inc. Rufus Scott is chairman of the board of directors of the new company. It is stated that this merger is the culmination of a plan that has been under consideration for some time. The company, which is capitalized at $9,000,000, owns mills at Riverside, N. J.; Trenton, N. J.; Reading, Pa.; North River, Tenn.; and Big Stone Gap, Va.

The Holeproof Hosiery Co., Milwaukee, Wis., are planning to increase the natural lighting conditions in their old buildings by the addition of monitors. Lockwood, Greene & Co., Engineers, of Atlanta, Chicago and Boston, have been engaged to draw up the necessary plans and specifications.

The Anthony Hosiery Mills, Fort Wayne, Ind., manufacturer of men's and women's cotton hosiery and kindred knit goods specialties, are planning for the establishment of a branch mill at Ulrichsville, Ohio.

The Fuld & Hatch Knitting Co., Albany, N. Y., manufacturer of cotton underwear and other knit goods products, has filed notice of increase in capital from $250,000 to $1,000,000 for increased production.

The Malden Knitting Mills, Inc., 62 Franklin Street, Malden, Mass., manufacturer of cotton jerseys, sweaters, and kindred knit goods specialties, are perfecting plans for the construction of a new plant addition on Eastern Avenue. The proposed structure will be four-story, 42 x 150 feet, and is estimated to cost about $75,000. S. S. Eisenberg, 46 Cornhill Street, Boston, is architect.

The Jersild Knitting Co., 331 North Commercial Street, Neenah, Wis., manufacturer of cotton jerseys, sweaters, and kindred specialties, has awarded the contract for its proposed new mill addition to C. R. Meyer & Sons, 50 State Street, Oshkosh, Wis. The structure will be 50 x 200 feet, and is estimated to cost about $42,000.

The Mather-Palmer Co., Grand Rapids, Mich., has filed

notice of change of name to the Grand Rapids Knitting Mills, at the same time increasing its capital from $120,000 to $700,000.

The Belgrade Knitting Co., New Cumberland, Pa., has awarded a contract for the construction of a new mill addition. The proposed building will be 50 x 100 feet, two-story, and is estimated to cost in excess of $100,000, with equipment. C. Harry Kain, 317 Chestnut Street, Harrisburg, Pa., is architect.

Hillman & Israel, 200 Fifth Avenue, New York, N. Y., manufacturers of knit goods, have arranged for the opening of a new mill to be devoted exclusively to the manufacture of sport sweaters, and giving employment to men operators only. This mill makes the fifteenth mill in the chain operated by the company.

The Fashion Knit Wear Mills, Inc., Peoria, Ill., recently incorporated under state laws, has arranged for the operation of a local plant for the manufacture of cotton knit goods.

The All-Right Hosiery Co., Inc., Philadelphia, Pa., has acquired the former plant of the Dowe Hosiery Mill, 2126 Somerset Street, and will remove its works, now located at Front Street and Lehigh Avenue, to the new site at an early date. It is planned to provide additional machinery for the manufacture of mercerized and plain cotton hosiery.

The Glenn Knitting Co., Twenty-first and Lippincott Streets, Philadelphia, Pa., is planning for increased production at an early date. The company is now operating a new plant at this location with facilities for extensive increase in output as compared with its former works. Thomas E. Brown is president.

The Servis Hosiery Co., Philadelphia, Pa., has been organized by Stein & Co., to operate a plant at Trenton Avenue and Adams Street for the manufacture of hosiery and other knit goods. A three-story building has been leased recently at this location.

Some American Knitting Corporations.

As an indication of the size of some of the 2049 establishments included in the knitting industry by the current Census Bureau report, a compilation has been made from directory reports on American knitting trades which shows 53 knitting corporations capitalized at a million dollars or more. The total capital of these 53 corporations reaches the imposing figure of $125,149,000. Among the concerns listed, however, are two—the Bibb Manufacturing Company and the Wiscasset Mills Company—that should not be classified strictly as knitting corporations as in these instances the knitting part of the product is only a small portion of the total output. However, the figures are of interest, and the corporations with their capital as given by the directories are as follows:

Julius Kayser Co.	$15,500,000
Taubel-Scott-Kitzmiller Co.	9,000,000
Durham Hosiery Mills	7,910,000
Bibb Manufacturing Co.	7,500,000
P. H. Hanes Knitting Co.	5,750,000
Utica Knitting Co.	5,000,000
Allen A Co.	4,000,000
The Wm. Carter Co.	3,500,000
Phoenix Knitting Works	3,500,000
Van Raalte Co.	3,250,000
The Munsingwear Corp.	3,100,000
Frisbie & Stansfield Knitting Co.	2,774,500
Lawrence Manufacturing Co.	2,500,000
Nolde & Horst Co.	2,500,000
Mohawk Glove Corp.	2,500,000
American Textiles, Inc.	2,000,000
Bradley Knitting Co.	2,000,000
Holeproof Hosiery Co.	2,000,000
Phoenix Underwear Co.	1,800,000
Ipswich Mills	1,750,000
Clayville Knitting Co.	1,500,000
Federal Knitting Mills	1,500,000
Hancock Knitting Mills	1,500,000
Wiscasset Mills Co.	1,500,000
Friedman-Blau-Farber Co.	1,350,000
Perry Knitting Co.	1,350,000
Wayne Knitting Mills	1,350,000
Wright's Underwear Co.	1,275,000
Simon Ascher & Co.	1,250,000
The Piqua Hosiery Co.	1,250,000
Chipman Knitting Mills	1,200,000
Globe Knitting Works	1,200,000
Notaseme Hosiery Co.	1,049,000
Chalmers Knitting Co.	1,040,000
Appalachian Mills	1,000,000
Atlas Underwear Co.	1,000,000
Augusta Knitting Co.	1,000,000
Berkshire Knitting Mills	1,000,000
Broadalbin Knitting Co., Ltd.	1,000,000
Interwoven Mills	1,000,000
Interwoven Stocking Co.	1,000,000
Lackawanna Mills	1,000,000
Merrill Silk Co.	1,000,000
Merit Hosiery Co., Inc.	1,000,000
Norwich Knitting Co.	1,000,000
Oneita Knitting Mills	1,000,000
Paramount Knitting Co.	1,000,000
Peerless Knitting Mills Co.	1,000,000
Richmond Hosiery Mills	1,000,000
Rich-Sampliner Knitting Mills Co.	1,000,000
Stephenson Underwear Co.	1,000,000
John K. Stewart & Sons	1,000,000
Superior Underwear Co.	1,000,000

Cost accounting is an accurate method for arriving at the cost of producing a complete and salable commodity and delivering it to the carrier for transportation, reporting in usable records all of the various elements which go to make up these costs. Records of costs are valuable in themselves, yet it is the detailed information which they contain, available for ready reference, which is of utmost value. Accurate information regarding the various elements which go to make up costs, as contained in cost records, automatically eliminates arbitrary, empirical, or guess costs which prevail to a surprising degree among many manufacturers. The cost system, like an X-ray picture, brings to light imperfect internal conditions and suggests correction.

The Yarn Market.

A general upward movement of prices, with a fairly good demand for yarns, featured the Philadelphia cotton yarn market during the past four weeks or so. Southern yarns, particularly those of the carded groups, seemed to possess the most effective recuperative abilities, with the result that prices were raised considerably on frame spun carded yarns on cones, two-ply warps, two-ply skeins—practically all of the southern products were offered at prices a few cents higher than when the month opened up.

A dropping off in inquiry and orders was not noted, however, because of the higher quotations, as numerous sales were reported at the higher figures. There were, of course, plenty of yarns to be had, but the overstocked market did not prevent a boosting of rates.

This advance was due, in part, to the stiffening of raw cotton rates, but it is pointed out that for some time past, spinners have been making an effort to advance prices, as it is shown that the prices that have been prevailing in the market were prohibitive of practically all profit, and in many cases, yarns sold at such prices caused a loss to the manufacturer. However, in a great many of the attempts to raise rates, the sellers weakened, with the result that the market dropped back again.

It is also indicated that where the low selling prices which have obtained forced manufacturers who operated under the conditions existing to do so with loss, the recent boost in raw cotton has been the last straw, and in order to stay anywhere near the right side of the ledger, the manufacturer was forced to do something to increase the margin between his production cost and his selling price. Having already, in most cases, reduced his operating cost to the ultimate limit, there was but one thing left for him to do when the higher rates for cotton raised his production cost, and that was to remedy the situation at the other end, to increase his selling price.

So, the general increase came hardly as a surprise to some, though it did play havoc with the plans of some buyers who still contended that it would be best to remain out of the market. These factors were caught with their stocks depleted, awaiting the lower prices which they felt would come, and the increased prices made it necessary for them to buy yarns at higher rates than those they could have gotten in on, or else take another chance that the market would come down, or if it didn't, to pay still higher prices, which they of course would not want to be the case at all.

In regard to the ability of the higher prices to endure, opinion, as usual, is at variance. Some are not convinced that the advance is permanent, though it is unanimously admitted that ample grounds exist for permanently higher levels, and many are rather indisposed to placing orders quickly. However, the general feeling in the market is much more optimistic than it has been for some time, and there seems to be some real basis for the expectation that the higher levels will hold. The rising tendency of the market acted as a stimulant to buying interest, and this, together with the general realization that to make profit spinners must have higher prices than those of the previous few weeks, and that spinners are going to make profits, would serve as an indication to much more active business just as soon as confidence is fully established in the stability of the prices.

Recent Philadelphia quotations follow:

Southern Single Skeins.

4s to 8s	21	10s	21½
12s	22	14s	22½
16s	23	20s	24½
24s	25½	26s	26
30s	28		

Southern Single Warps.

8s	21½	10s	22
12s	22	14s	23
16s	23½	20s	24½
26s	26	30s	28 @29
40s	37 @40		

Carpet and Upholstery Yarns in Skeins.

8s and 9s 3-4 slack	22
8-2-4 tinged tubes	16
8-3-4 hard white warp twist	20
8-3-4 hard twist waste	15½

Southern Two-Ply Skeins.

8s	21	10s	21½
12s	22	14s	22½
16s	23 @23½	20s	24½
24s	25 @25½	26s	26 @27
30s	28 @30	40s	37 @40

Southern Two-Ply Warps.

8s	22	10s	22½
12s	23½	14s	23½
16s	24	20s	24½ @25
24s	25½ @26	26s	26½ @27½

Southern Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	45	20s	46
24s	47	30s	50
40s	60	50s	68 @70
60s	80 @85	70s	90 @95
80s			$1.05@$1.10

Southern Frame Spun Carded Yarn on Cones.

8s	22	10s	22½
12s	23½	14s	24
16s	24	18s	24½
20s	25	22s	25
24s	25½ @26	26s	27 @27½
30s	28½ @30½	40s	39 @40
30s double carded			32 @33
30s tying-in			26 @27

Northern Mule Spun Carded Yarn Cones.

10s	27	12s	28
14s	29	16s	30
18s	30½	20s	31
24s	33	26s	34
30s	37	40s	45

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	35	12s	36
14s	37	16s	38
18s	39	20s	39 @40
22s	41 @42	26s	44 @46
28s	47 @48	30s	49 @50
36s	56 @57	38s	58 @60
40s	60 @62		

Must Dig Away the Hill.

The July Foreign Trade Review, issued by The National Shawmut Bank of Boston, emphasizes the fact, too often overlooked, that banks cannot create the exchange credits, so useful a feature of foreign trade—"trade balancing trade, must do that." The article says: "Trade cannot freely climb a strong up-grade and if we wish to secure its full volume, we must dig away the hill of unequal exchange."

"To level this hill we must transfer money or credits to Europe otherwise than in payment for goods. Something of this can be, and is, done in payment for 'invisible imports',—transportation, insurance and other services; but our chief opportunity is through foreign investments. In the days when we were a debtor nation Europe sent capital here to finance our industries. This served to balance exchange, and, in the early days of the War provided a fund of credit for the Allies' purchases. Now that we have the credit we must, if we are to restore a measurable parity of exchange, send it to Europe on the security of Europe's capital goods,—her reliable industries; and for a year and a half we have had, in our Edge Law, a Government provision for advantageously effecting this by transforming foreign mortgages into safe-guarded debentures that should be readily salable in our markets."

Reference is made to the so-called Ter Meulen plan for dealing with the present exchange situation. The article points out that while this plan may prove a valuable adjunct to the Edge Law it should be borne in mind that our participation means not only that we are doing our duty, but are, in addition, taking advantage of a profitable opportunity.

JOHN D. LEWIS

Manufacturer of

Logwood, Cutch, and Other Dyewood Extracts

TANNIC ACID

Main Office
1209 Turk's Head Bldg.

PROVIDENCE, R. I.

Works
Charles & Bark Sts.

BRANCH OFFICE:

NEW YORK, N. Y.
2-4-6 Cliff St.

PHILADELPHIA, PA.
583 Drexel Bldg.

BOSTON, MASS.
Old South Bldg.

Equip Your Spinning Frames

WITH THE

New "AMTEX" Special

TREATED OILPROOF SPINNING AND TWISTING TAPES

This Tape made from our High Grade Fabrics, treated so that it is absolutely oil and moisture proof, saves time and money by giving twice the wear of ordinary tape, has 25% more tensile strength, grips the spindles insuring a steady smooth pull, and increases production.

Made and Sold by

THE AMERICAN TEXTILE BANDING CO., INC.,

Main Office and Mill
Belfield Ave., & Wister St., Germantown.

Philadelphia, Pa.

Treasurer's Office
23 South Second Street.

JOSEPH T. PEARSON & SONS CO.

MANUFACTURERS OF

BONE DRY
HOSIERY FINISHING BOARDS

THAT WORK ABSOLUTELY SMOOTH

PROMPT SERVICE—RIGHT PRICES

1815 E. Boston Avenue, Philadelphia

BETTER CONTROL OF FINISH

IS OBTAINED BY BOILING-OUT
COTTON GOODS OF ALL KINDS IN

PEERLESS COMPOUND

Remarkable results are being secured through replacement of caustic boils. May we send you particulars? Specify your conditions when writing.

Write F. & S. Dept. C. 874 Broadway New York City

GENERAL MACHINE WORKS

YORK, PA.

Manufacturers of

Circular Rib Knitting Machinery

Cylinders and Dials

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1913" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIESCHING, 614 Broad St., Utica, N.Y., U. S. A., Dept. "C."

A Duration Time Study Watch.

To meet the ever increasing demands of industry for time and motion study equipment, a new instrument has been perfected termed the duration time study watch, designed to handle the timing, analysis and observation of from one to ten operations, up to and including five minutes of duration.

The instrument, which is illustrated here has three circles on the face of the dial, the outer circle being in red, the center circle in black and the inner circle in blue. The large hand makes a total revolution of 100 seconds, and the small hand in the center moves over a red, black and blue sector, thereby showing in which circle the large hand is operating.

All of the figures on the face of the dial denote production per hour, based on the timing of 10 operations. As an instance: if 10 operations were observed to have elapsed in 20 seconds the figure under the large hand in the red circle

would show 1,800 operations per hour, based on 10 operations having been completed in 20 seconds. If instead of 10 operations, one operation is observed to have lasted 20 seconds, then instead of 1,800 it would be necessary to point off one figure with a decimal, and the result would be 180 operations per hour, based on one operation being completed in 20 seconds.

If an operation is timed and its duration is 130 seconds it will be noted that the large hand will have made one total revolution, and thirty seconds additional, and the small hand in the center of the dial will have passed the first sector, and show in the second sector, which is the black, and which denotes that the operation must be read in the black circle; and reading under the 30-second mark in the black circle the figure 277 will be noted. However, this figure being based on the observation of 10 operations, and only one operation having been timed in that period, it is necessary to point off one figure, and the result is then 27.7 operations per hour, based on one operation timed in 130 seconds. The same applies to operations of longer periods; the small hand moves in the colored sector, showing in which circle the large hand is operating, and makes it easy to calculate the elapsed time.

The instrument has the takeout time feature, which allows the operator to start and stop the watch without returning the large hand to "zero," and when an operation is entirely completed pressing the crown down returns all hands to the starting point. The dial is divided in seconds and half-seconds.

The instrument is of a very sturdy type, designed for industrial purposes, and with the present endeavors to analyze and cut costs it should prove a valuable adjunct in many plants.

The Seventh National Chemical Show.

The Seventh National Exposition of Chemical Industries will be held during the week of September 12 to 17 inclusive, at the Eighth Coast Artillery Armory, New York City, and this year's show promises to be an unusual medium for presenting the developments and achievements of the American chemical industry in an exposition of practical educational and helpful exhibits. More than 400 exhibitors have engaged space for the event this year, and it has been made necessary to stage the show in a building which covers an area of five city blocks.

All exhibits in the show will be on one floor, and it is announced that in the outlay of exhibits there will be many evidences of the results of the progress in chemical research during recent years in this country, and the new methods of production and manufacture which have resulted therefrom, which will be of considerable general interest. Textile manufacturers will have a specific interest in the show inasmuch as the exhibitors include a large number of manufacturers of products used in textile mills, and mill men may have the opportunity of looking over the latest developments in the way of dyestuffs and other articles used by them.

An especially interesting program has been arranged for this year's show, and exclusive of the exhibits and other features, this program will be carried out in speeches, lectures and papers of value to the investigator along chemical lines. A special auditorium, arranged according to the plan of a theatre, has been erected at the exhibit hall, having a seating capacity of approximately 1,400, which will provide a suitable place where the lectures, speeches, discussions, etc., may be held. One of the drawbacks to the show in recent years has been the failure to secure proper accommodations for the many visitors who wanted to hear the scientific side of the industry discussed, and the management has therefore made provisions for a quiet and comfortable lecture hall which will offer a place for the many symposiums that will be held during the week. In addition to the addresses, speeches, practical talks, etc., there will be "get-together" meetings between the manufacturers and consumers of certain products for a mutually beneficial exchange of ideas. Also, there will be motion pictures which will be exhibited in the lecture hall, covering manufacturing processes in a number of industries.

Features of the program which seem to be of interest to textile manufacturers are the following: "Drying and Drying Problems," by H. S. Landell, of Proctor & Schwartz; "Drying as an Air Conditioning Problem," by A. W. Lissauer, of W. L. Fleisher & Co.; and "The Relation of At-

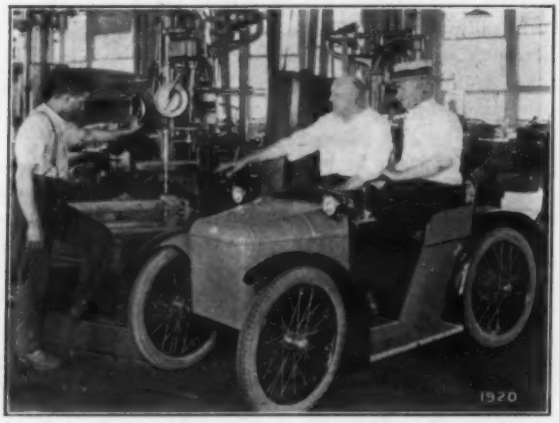
mospheric Conditions to Chemical Processes," by A. E. Stacy, Jr., of the Carrier Engineering Corp. R. M. Gordon, of the Solvay Process Co., is also scheduled for an illustrated lecture.

The largest interest of the textile manufacturer in the exhibits will be in the dyestuff sections, and the exposition will make every effort to stress the American dyestuff situation. The stated purpose of the dyestuffs exhibits will be to prove the superiority of American made products and to educate the manufacturer to the proper use of American dyes. Demonstrations will be offered and experiments encouraged. The importance of the dye industry in relation to warfare will be illustrated in the exhibits and lectures. It is also planned to have discussion meetings between the dyestuffs manufacturers and the textile mill men where they may discuss mutual problems and exchange ideas and opinions.

Other exhibits in which textile manufacturers will be interested will include those of air conditioning apparatus, economical storage facilities, shipping containers, water softeners, pumps and condensers, dryers, and automatic controllers for temperature, pressure, time, levels, etc. It is understood, of course, that in each of the exhibits will be shown the latest improvements and developments in each respective machine, process or product, and representatives will be present at the exhibits to discuss from an expert standpoint any question which might be presented by the interested visitor.

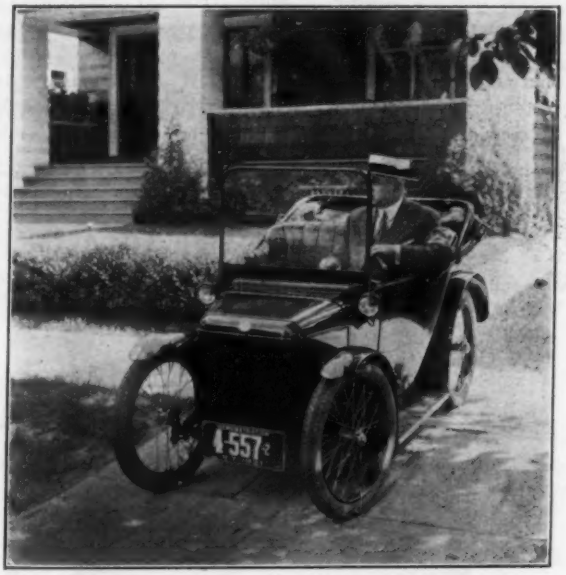
Something New in Motor Cars.

A new electric motor car that has recently been put on the market by the Automatic Transportation Company, of Buffalo, N. Y., who are represented in the southeast by the J. D. Collins Sales & Engineering Co., Atlanta, Ga., combines some very novel features for the use of the mill man. The car is made in three models: one for ordinary



business purposes, for a mill man to use in riding from his home to the office, or from the mill to the nearby village post office or for the transportation of officers of the company or clerks from plant to plant in a group of mills; a commercial model that may be used for the transportation of light packages from the mill to the express office or in the opposite direction, or for any other purposes of light transportation between the plants; and a third model, or an industrial model, which is of especial interest to factory managers or other executives in that it provides a quick and convenient method of inter-shop transportation thus saving the time of the busy executive in making inspections and keeping in touch with the various departments of the plant.

The size and flexibility of this car allows the driver to go anywhere about the plant. It has a narrow tread of 35 inches and a short wheelbase of only 65 inches which allows it to be negotiated through the majority of factory aisles and doorways, and allows it to be transported from floor



to floor on the regular freight elevator of the mill. As it has a seating capacity for two persons, it could also be very pleasantly and comfortably used by the executive to take a visitor through the plant or plants of the company, not only carrying him from mill to mill but from department to department in the mill without effort and at a great saving of time.

It is efficient and economical and at the same time will do anything that a large car will accomplish within a radius of 50 to 60 miles at a speed of 15 to 18 miles per hour if such a speed should seem desirable. It can be operated for a few cents a day and the initial expenditure is not excessive. Being noisless, clean and ever-ready, it offers a quick and convenient method of transportation for the busy executive in looking after the thousand and one details that must have the personal attention of the manager or the general superintendent.

The economy of the Automatic electric is obvious. The recharging of the batteries constitutes practically the entire operating expense and this may be done at a cost of only a few cents a day from the regular mill circuits. A complete charging apparatus can be secured with each car and the amount of care and attention required is negligible. The illustrations show two of the models.

It takes a powerful memory to keep up with what you say if you talk much.

Fair Treatment Necessary to Get Money.

Money is the most solicited commodity in the world today. It cannot be commanded or coerced. It must be persuaded. Its chief demand is to be convinced that its investment will be secure; that when once planted, it will not be confiscated or taken away; that it will not be denied fair treatment, just consideration, or an opportunity to earn a reasonable return.

"The Wheel of Progress"

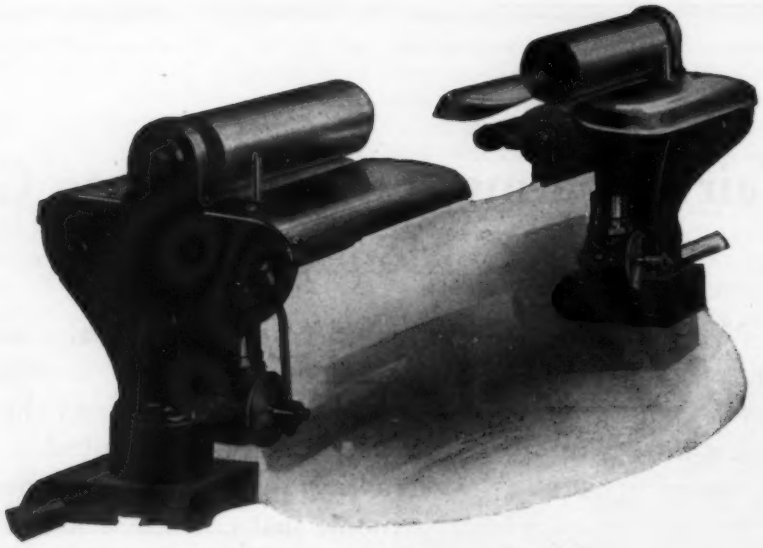
THE GEORGIA RAILWAY AND POWER COMPANY

Surely, with the value that utilities are to the communities, the people should see that it is to their own interest not to render impossible the obtaining of the money necessary for the continued development, expansion and improvement of these facilities.

If the utility is treated as an outcast in the community where its properties are located, if just treatment is denied it, if fair consideration is refused it, that utility cannot obtain the necessary capital to carry forward its work of serving the community, and inevitably the service deteriorates, the costs of operation increase, all growth stops, and the injury is borne not by the utility alone, but by the whole community as well.

The Tugaloo development in North Georgia where this Company has spent $1,000,000, has been compelled to suspend operations, awaiting the dawn of political peace and the investment of further new capital.

The Georgia Railway and Power Company



Foxwell Pneumatic Guider and Feeder

A worker that never pauses to think, never tires, never quits, draws no wages and works with mechanical precision and accuracy. That's the "Foxwell Pneumatic Guider and Feeder."

FINISHING
Butterworth
MACHINERY

THE BUTTERWORTH LINE INCLUDES

Ageing Machines	Hydraulic Presses	Mangles (all kinds)
Bleaching Machines	Dyeing Machines	Calenders (all kinds)
Drying Machines	Soaping Machines	Color Kettles
Singeing Machines	Tentering Machines	Cell Dryers
Mercerizing Ranges		

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA

PROVIDENCE OFFICE
Turk's Head Building

Canadian Representative
W. J. WESTAWAY COMPANY
Hamilton, Ontario Canada

TOLHURST EXTRACTORS

are especially constructed for
Rapid Operation and Quick Handling

A 48" engine driven **Tolhurst** "Center-Slung" Open-Top Patented Extractor arranged for unrestricted access, rapid delivery and quick discharge. This machine is operating in a plant famous for the manufacture of hosiery, and is but one of the **Tolhurst** Machines used in this plant, the first having been installed in 1913. Detailed information relative to the remarkable service given by this and other Tolhurst Extractors in this and other plants will be sent to those interested.

Tolhurst "Center-Slung" Patented Extractors are constructed with baskets 40" and 48" in diameter and are arranged for motor, countershaft or engine drive. They have roller bearings, lubricated with grease.

TOLHURST MACHINE WORKS

Established 1852 **TROY, NEW YORK**

New York Office, 111 Broadway

Southern Rep.:
Fred H. White,
Realty Bldg.,
Charlotte, N. C.

Western Rep.:
John S. Cage,
Hartford Bldg.,
Chicago, Ill.

San Francisco Rep.:
B. M. Pilhashy,
Merchants Ex. Bldg.,
San Francisco, Cal.

Canadian Rep.:
W. J. Westaway Co.,
Main & McNab Sts., Hamilton, Ont.
400 McGill Bldg., Montreal.

Machines Don't Strike

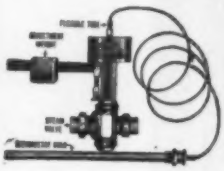
Responsibility is irksome to some men—routine to others.

Automatic control of temperatures relieves your men of both responsibility and routine—it helps to relieve the "spirit of unrest" which seldom occurs where tasks are not irksome.

Begin now to eliminate some of the causes of discontent by putting Automatic Heat Regulators on your dyeing machines and vats, drying rooms, heating systems, hot water tanks, shower baths—any and every place where heat control is desired.

The Powers Regulators

The Powers Regulator No. 11 is only one of the many types of Powers Regulators, some of which will exactly meet your requirements. Allow our more than 30 years of experience to be or service to you in your problem.



These accurate, dependable machines positively and automatically control the heat at the **point of use.** Their economy is fourfold:

1. They **save labor** by releasing men who now attempt to control heat by hand.
2. They **save material** by preventing losses from spoiled or sub-standard output.
3. They **save fixtures** by preventing overheating.
4. They **save fuel** by using only necessary heat.

We have spent more than thirty years in studying temperature control and have gained a vast fund of practical information which is cheerfully given.

(1552)

This is Your Answer

Whenever there is a need for maintaining a definite, even temperaure, the Powers Heat Regulator is now used in thousands of factories and homes. Fully described in our Bulletin 129.

Write us, stating fully any problem of heat regulation. We are cheerfully at your service.

The Powers Bulletin contains accurate information on heat control, and complete details of Powers Regulators. They are yours for the asking.

Let Your Men Wash in Comfort

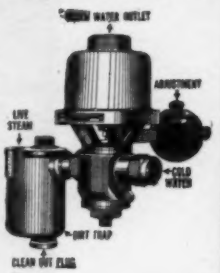
Here is a real convenience and comfort for everyone in your plant. You save and the men benefit when you install a Powers Steam and Water Mixer on the showers and wash sinks of your plant.

This automatic, instantaneous, economical water heater delivers water at just the right temperature—which shortens washup time for everybody.

Try One 30 Days at Our Risk

The Powers Steam and Water Mixer

—an instantaneous water heater, absolutely safe against scalding. Saves 50% in the cost of fixtures because only one faucet is necessary for each man.

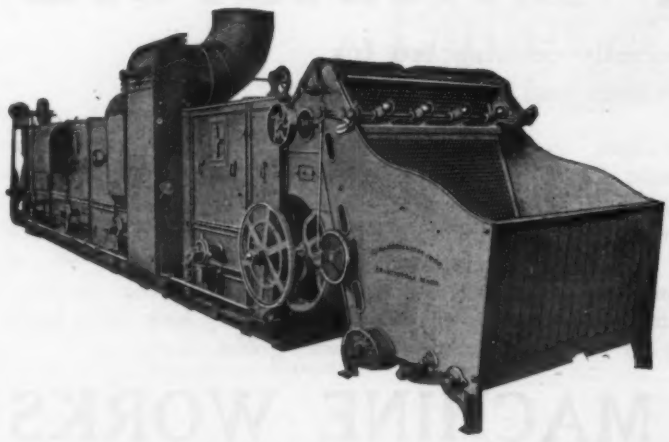


THE POWERS REGULATOR CO
Specialists in Automatic Heat Control

985 Architects Bldg., New York 2761 Greenview Ave., Chicago
596 Boston Wharf Bldg., Boston
The Canadian Powers Regulator Co., Ltd., Toronto, Ont.

Southern Representatives: "ASKUS" Guy. L. Morrison, Charlotte, N. C. Ira L. Griffin, Greenville, S. C.

PRE-EMINENCE



in any line signifies a superiority, the attainment of which requires the highest merit possible.

SARGENT DRYERS, with over fifty years of specialization in dryer manufacture behind them, thorough in design and construction, embodying painstaking experiments and tests—have the required high merit which justly entitles them to pre-eminence in the drying machinery line. The endorsement of mills and finishing plants which stand at the head of the industry is stronger arguments than anything we can say about SARGENT DRYERS. They are recognized as standard the world over.

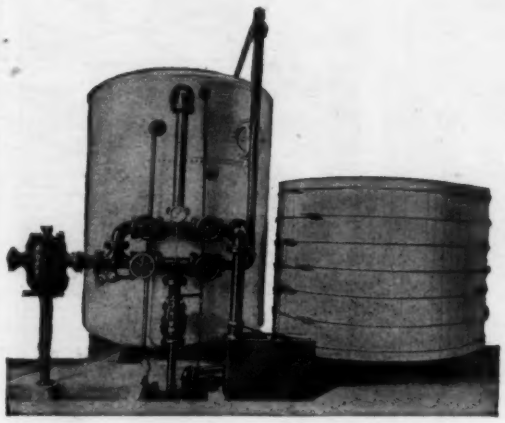
Write today and let us explain the principles of SARGENT DRYERS. Made in models for drying cotton, linters, wool, hair, flax and any raw material.

C. G. SARGENT'S SONS CORP.
GRANITEVILLE, MASS.

Fred H. White, Southern Agent
Charlotte, N. C.

Sargent Dryers

True Matching of Silk Hose and Cotton Upper Made Easy



A mill of national reputation, producing silk, cotton, woolen and mixed hose, experienced difficulty in their dyeing processes. In August, 1919, they installed Permutit Water Softening Equipment to remove all hardness from their water supply, and immediately noticed many manufacturing improvements.

One of their most difficult processes had been to match the color of silk hose with its mercerized cotton upper in one dye bath, but when soft water was used this difficulty disappeared. It was also found possible to match difficult shades at various times with the same formula, and in addition much time and labor from re-dyeing was saved.

Permutit is solving dyeing problems everywhere. All investigations are made free of charge. Write us today.

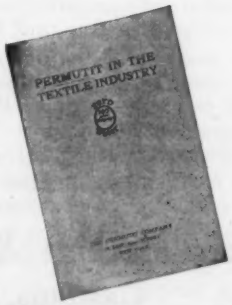
The Permutit Company
440 Fourth Ave. New York

Filters—Water-Softeners—Special Apparatus

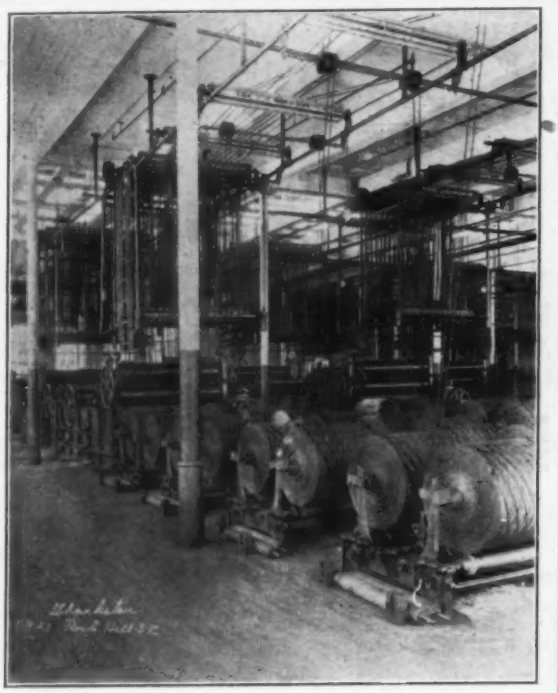
Zeolite Water Softener Patent Sustained

The Federal Court at Buffalo (Hazel J.) on June 15, 1921, handed down a decision sustaining our broad patent covering Zeolite Water Softeners. According to this decision all Zeolite Water Softeners on the market not made by us are an infringement of this patent.

No need to borrow trouble—buy Permutit—it is the best anyway.



This booklet contains valuable information that every mill operator should have. Sent free, postpaid, upon request.



Continuous System Indigo Dyeing Equipment for Warps

In the equipment illustrated fifteen warps are led through a Two Compartment Boiling Out and Cooling Machine, through two Indigo Vats, and taken up by Dye House Ballers in one operation in an initial run.

In a second run the fifteen warps are led through two Indigo Vats, and are taken up by Dye House Ballers.

In a third or finishing run, five of these warps are led through a Two Compartment Wash Box operating in connection with the Dry Cans equipped with a five-unit Coiler.

The successful handling of warps through Continuous Dyeing Systems such as described is only possible through the use of Automatic Tension Controls and Regulators such as we build and use with our Dyeing Equipments.

For further particulars and prices, write or wire

Cocker Machine & Foundry Co.

Gastonia, N. C.

Builders of Warpers, Beamers, Warp Dyeing Machinery

WARPING MACHINERY

Linking Warpers—Linker Heads—Balling Warpers—Balling Attachments—Section Beam Warpers—Special Warpers.

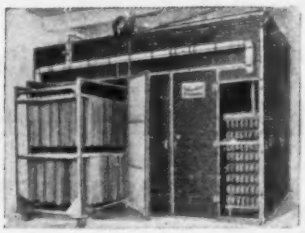
WARP BEAMING MACHINERY

Long Chain Beamers—Short Chain Beamers—Warp Splitters—Special Beaming Machinery.

WARP DYEING MACHINERY

Boiling Out Boxes—Continuous Systems—Sizing Machines—Doubling and Splitting Systems—Sulphur Machines—Indigo Vats—Warp Coilers—Dye House Ballers—Hydro Sulphite Equipment—Warp Bleaching Equipment—Drying Cans.

DRYING



The "Proctor" Truck Dryer for all kinds of yarn in skeins and many other materials—wonderfully compact, efficient, fire-proof. Makes the user sure of correct, trouble-free, most economical drying.

Send for a catalogue. It will acquaint you also with the "Proctor" Automatic Yarn Dryer.

PROCTOR & SCHWARTZ, INC.,
formerly The Philadelphia Textile Mach'y Co.
PHILADELPHIA, PA.

"Proctor" DRYERS

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON DYEING - BLEACHING- SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W Machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the "world's best dyeing, bleaching and finishing machinery."

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.

AN OPEN LETTER ON COTTON WARP SIZING

Mr. Cotton Mill Executive:

An authority on the chemistry of practice and cotton warp sizing states: Many cotton manufacturers would be astonished at the amount of saving that could be effected in their sizing process if they could only be persuaded that positive results could be obtained on a more efficient basis, at a very much lower cost, with modern highly standardized commodities.

Our Textile Laboratory, cognizant of the vital importance of the primary treatment of the cotton warp and its relation to the subsequent processes, has, in no small degree, demonstrated the truth of the foregoing statement in New England and Southern cotton mills during the past decade.

AMALOL and GLUANTINE are displacing older methods wherever used and invariably show an appreciable saving from start to finish. Let us prove to you the ready adaptability of AMALOL and GLUANTINE in your plant, and moreover, do not fail to read the interesting literature that has recently been sent you.

We will gladly ship you on approval a barrel each, and furnish correct formula for your individual requirements.

List of users gladly furnished.

L. SONNEBORN SONS, INC.
Textile Products Division
262 Pearl Street, New York City

"HURRICANE" AUTOMATIC STOCK DRYER

Automatic Stock Dryer for Cotton, Wool, Linters, Hair, Etc.—(Single Apron Type)

Uniformly and quickly dries all grades of raw stock, preserving the full, natural strength of the fibre. The dried material is fine in appearance and feel.

Accurate temperature control prevents all danger of scorching or overdrying. As the stock enters the machine in a wet condition hot currents of air are circulated through it, and as the percentage of moisture decreases the temperature is reduced accordingly. When it comes out of the machine it is in an excellent, cool condition.

Minimum steam and power is consumed, and labor cost is small, the process being entirely automatic.

Send for Catalog SD-3

The Philadelphia Drying Machinery Company

Drying, Dyeing and Finishing Machinery

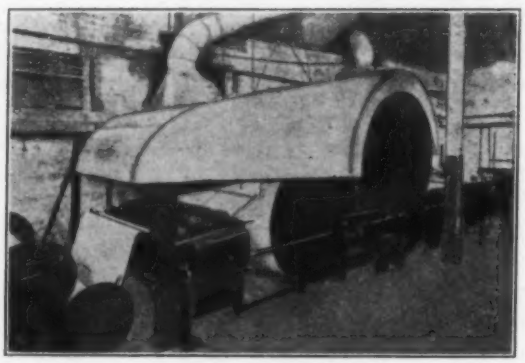
Southern Representative
G. G. Slaughter Machinery Company
Greenville, S. C.

Stokley Street above Westmoreland
Philadelphia, Pa.

Boston Agency
53 State Street

A New Slasher Hood

---improves the sizing process



Patented by R. O. Pickens

Far better results from the sizing process are effected by the radical improvements embodied in the new *Pickens Slasher Hood.*

The large hood, completely covering both cylinders and the size box, collects and carries away all vapors, eliminates condensation on the yarn and aids in the proper drying of the dressed yarn.

The plan of construction of the hood is in accord with scientific practice and practical experience, making the *Pickens Slasher Hood* the most nearly perfect hood on the market today both from the viewpoints of efficient operation and results attained.

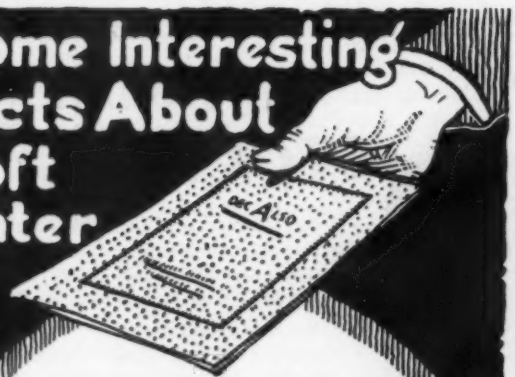
Built in sections of the best grade galvanized metal or copper, the hood may be shipped in knocked down form. This same feature facilitates repairs; only a screwdriver and pliers are needed to replace a rusted section.

Send for further information.

R. O. PICKENS SLASHER HOOD CO.

Spartanburg South Carolina

Some Interesting Facts About Soft Water



THIS little booklet contains facts that will be found interesting and valuable to textile mill executives—explains how soft water can eliminate many of the wastes you think inevitable—how it will increase production and profits.

It tells about the "DECALSO" Zero Water Softener—the most up-to-date and efficient apparatus for producing water without a trace of hardness—why it is the most scientifically designed softener to be had—why it is more dependable and steady in operation than any softener on the market, and other facts.

Write for a copy today. Our experts are always at your service ready to solve your water problem.

The Oldest Manufacturers of Water Softeners in the Country

AMERICAN WATER SOFTENER CO.
PHILADELPHIA, PA.

FILTERS

PRESSURE GRAVITY

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep,

Perfect satisfaction.

NORWOOD ENGINEERING CO.

Florence, Mass., U. S. A.

CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.

MATHIESON CHEMICALS

Quick Deliveries

DIRECT FROM THE PRODUCERS

Our service to Southern plants is proving both pleasing and profitable to them. When you want chemicals and bleaching materials you want them quickly, and we believe we are in a position to give you the prompt service that you desire better than anyone else.

Our big works at Saltville, Va., is located near you. Our Southern Office at Charlotte is still closer to you. There are also maintained stocks at several other centrally located points in the South. Write, wire or phone our Charlotte office and your shipment will be rushed to you from the point located nearest you. It reaches you more quickly than you could secure it elsewhere and at a saving in transportation charges.

It is needless to tell Southern men about the quality of Mathieson Chemicals for the majority of them know that no better products can be purchased anywhere. They come direct to you from the actual producers. When in need of any of the following products, remember Mathieson can serve you with quality products more quickly.

Liquid Chlorine	**Virginia Soda (Sesquicarbonate of Soda)**
Bleaching Powder	**Bicarbonate of Soda**
Soda Ash	**Chlorine Solvents**
Caustic Soda	

EAGLE-THISTLE BRAND

Write, wire or phone us—any time.

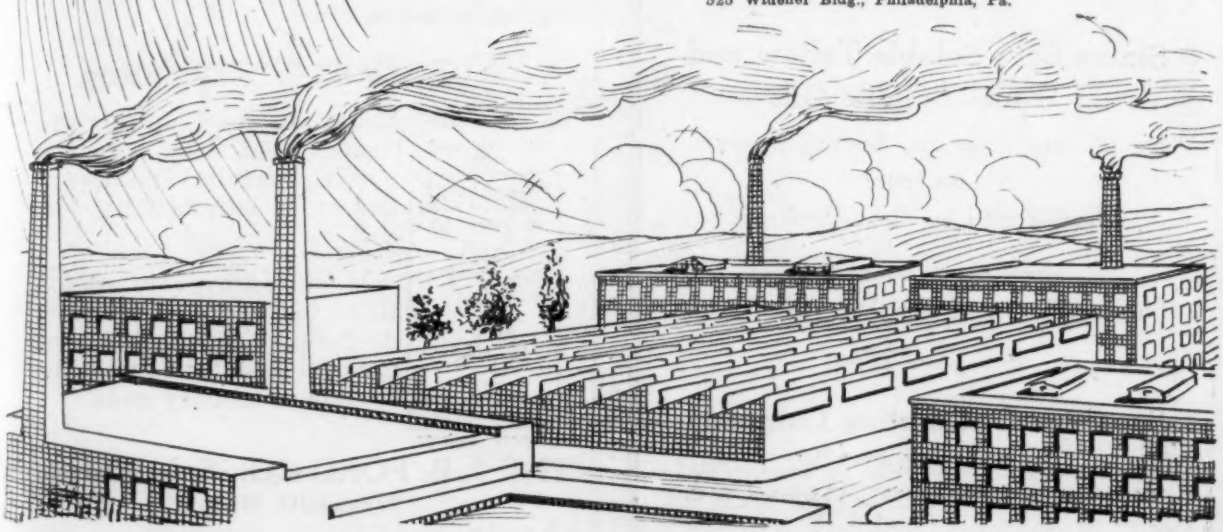
THE MATHIESON ALKALI WORKS, (Inc.)

Executive Offices
25 West 43rd St., New York City

Southern Sales Office
Commercial National Bank Bldg., Charlotte, N. C.

WORKS: Saltville, Va., and Niagara Falls, N. Y.

BRANCH OFFICES
327 So. LaSalle St., Chicago, Ill.
911 Hospital Trust Bldg., Providence, R. I.
525 Widener Bldg., Philadelphia, Pa.



CIBA COMPANY, INC.

CEDAR AND WASHINGTON STREETS, NEW YORK

Sole representatives in the United States of the

SOCIETY OF CHEMICAL INDUSTRY IN BASLE, SWITZERLAND

Special attention is called to the

ROSANTHRENE COLORS

(Developed Colors—Fast to Light and Washing)

BRANCHES:

BOSTON PROVIDENCE PHILADELPHIA CHICAGO COLUMBUS, GA

STAUSS

SOLUBLE 68 per cent TALLOW

Stauss 68% Soluble Tallow and Gum—Soluble Oils

for all warp sizing and finishing purposes.
None better.
Manufactured by Geo. P. Stauss,

Importers and Distributors of

Starches, Softeners, Weighting Compounds

Write, phone or wire

Southern Distributing Company

Manuel Faulkner, Sales Mgr.

50 Market St., Phone 3439 Charleston, S. C.

YOUR DESIRE

Your desire to supply clean, sanitary laundry work caused you to install a community laundry of your own. Maybe your work is costing you too much, or maybe it is not as clean, as soft, and as sanitary as you wish it was.

Community laundries are rapidly turning to the use of

"Wyandotte" Yellow Hoop

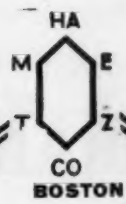
for in it they find a safe, sure, sanitary detergent that does give the required results, and does it too at a surprisingly low cost.

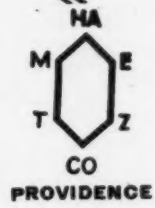
This trade mark card

in every package.

If you believe you are entitled to better results, write us for particulars about the use of this unusual and widely known laundry soda.

THE J. B. FORD CO., Sole Mnfrs.,
Wyandotte, Mich.





President Harding Says

"WE WANT less Government in business and more business in Government."

Licensing and the embargo as suggested by certain interests is "Government in Business with a vengeance.

As a consumer of dyes, the question of licensing imports affects you materially.

It is up to the consumer to decide for himself.

Now is the time to make your position clear to your Representatives and Senators.

Aside from the line of Dyestuffs, Intermediates, Cotton Finishes, Turkey Red Oils, Soluble Oils and Leather Oils made in the U. S. by

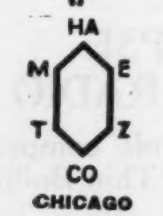
CONSOLIDATED COLOR & CHEMICAL CO.

and

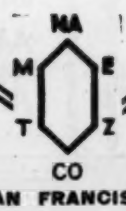
CENTRAL DYESTUFF & CHEMICAL CO.

we can also procure for you vat and other colors on licenses at lowest prices quoted for export by the European manufacturers.

A new color card of American made colors on cotton yarn is being distributed. Have you received your copy?



H. A. METZ & CO. Inc.
One-Twenty-Two Hudson Street, New York City.
Boston Philadelphia Providence Chicago Charlotte San Francisco



Established 1815

ARNOLD HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

All Kinds of
HEAVY CHEMICALS

Sole Agents for
BELLE ALKALI CO.
of Belle, W. Va.

Manufacturers of
LIQUID CHLORINE
CAUSTIC SODA
Solid and Flaked

We solicit your inquiry for prompt or future delivery

BOSSON & LANE

Manufacturing Chemists

Specializing
in
BLEACHING
DYEING
SIZING
AND
FINISHING
TEXTILES

Works and Office
Atlantic, Massachusetts

TEXTILE

STARCHES

THIN BOILING

WHITE OAK
ECLIPSE
RADIO

These Three Brands comprise all fluidity grades of Thin Boiling Starch.

Through cooperation, we can "fit" the fluidity grade to the Mill Superintendent's actual Starch requirements in Textile Construction and Finish.

Always—Uniform Pure and Clean

A. E. STALEY MFG. CO.
DECATUR, ILLINOIS

"DEVELOPENE"

Leaves No Argument as to When

"BLACK IS BLACK"

WHY BE SATISFIED

with a RUSTY BLACK when you can have a RICH LUSTROUS BLACK by finishing your Hosiery with the latest, most efficient and satisfying patented preparation

"DEVELOPENE"

A Demonstration Will Convince You

Send us a pair of unfinished stockings, skein of yarn or a piece of fabric—cotton, silk, artificial silk, wool or mixes—which has been dyed black, washed but not finished. We will finish it with **"DEVELOPENE"** and return to you.

There will be such an improvement that you will immediately want **"DEVELOPENE"** for finishing ***your*** goods.

No further softener — or soap — required. Makes hosiery slip on and off the board easily —leaves the product soft and pliable.

Manufactured Only by the

KALI MFG. CO.

1404-1410 North Front Street

PHILADELPHIA, PA.

Sole Manufacturers of

HYDROXY OIL, KALI CHLORINE NEUTRALIZER and ANHYDROUS GLAUBER'S SALT

The Grasselli Chemical Co.

DYESTUFF DEPARTMENT

Works at:

GRASSELLI, N. J. ALBANY, N. Y.

SULPHUR COLORS: Black, Blue, Brown, Green.
Direct Cotton Colors, Acid and Chrome Colors
MONOPOLE BRILLIANT OIL
Bichromate of Soda Sodium Sulphide
Zinc Dust, Chemicals and Acids

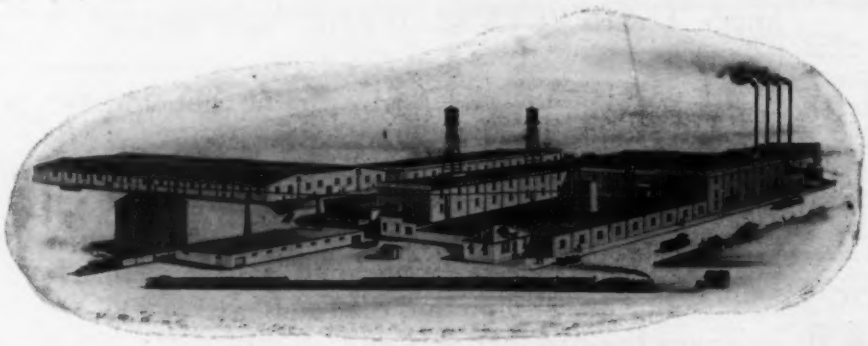
BRANCH OFFICES:

New York	Philadelphia	Birmingham	Charlotte	St. Paul
Boston	Chicago	Cleveland	Cincinnati	Providence
St. Louis	Detroit	New Orleans	Milwaukee	New Haven

The Grasselli Chemical Company, Limited

Toronto Hamilton Montreal

Sole Selling Agents for Essex Aniline Works, Inc., Boston, Mass.



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

ZAVON

The Super Solvent

Will increase your business by improving the quality of goods produced in your mill. ZAVON excels all other solvents BECAUSE:

1st. It creates an affinity for the dye thus producing even, rich effects.

2nd. It replaces soap in the kier, affecting a marked saving in operating costs.

3rd. It removes all stains from knit goods and hosiery.

4th. It greatly reduces the amount of "seconds" in hosiery mills.

ZAVON will be found to be a superior softener for penetration.

For mills using silk and cotton mixture ZAVON can be used both as a softening and cleaning agent.

We are in a position to handle all orders promptly and are always pleased to send working samples upon request.

ZAVON COMPANY

INCORPORATED

Bush Terminal, Bldg., No. 1 ***Brooklyn, N. Y.***

American Yarn and Processing Company

MOUNT HOLLY, N.C.

Successors to

AMERICAN PROCESSING CO.
ADRIAN MANUFACTURING CO.
ALSACE MANUFACTURING CO.
NIMS MANUFACTURING CO.
UNION COTTON MILLS
WOODLAWN MANUFACTURING CO.

Spinners and Mercerizers of

HIGH GRADE COMBED AND CARDED YARN

16s to 80s SINGLE AND PLY

WARPS, SKEINS, TUBES AND CONES

MERCERIZING BLEACHING GASSING

IN A NEW AND STRICTLY MODERN PLANT

HIGHEST QUALITY PROCESSED YARN

We are located in the center of the combed yarn spinning industry of the South and are enabled to furnish you with highest quality processed yarns in all numbers.

NEW YORK REPRESENTATIVE:
H. B. ROBIE, 346 Broadway.

PHILADELPHIA REPRESENTATIVE:
FORREST BROS., Forrest Bldg.

JACQUES WOLF & CO.

Manufacturing Chemists and Importers

PASSAIC, N. J.

ALL SIZING and FINISHING PRODUCTS for COTTON

CREAM SOFTENERS

HYDROSULPHITE

For stripping and discharge printing.

BLEACHING OIL

Kier boil assistant.

SOLUBLE OILS

MONOPOLE OIL

Reg. Trade Mark No. 70991.

Visit Booths No. 828-830-832

Seventh National Chemical Exposition
8th Coast Artillery Armory,
New York—Sept. 12-17.

HEADQUARTERS OF RAW MATERIALS for the TEXTILE INDUSTRY

Carbonate of Soda	Caustic Potash
Chloride of Lime	Caustic Soda
Aniline Oil	Aniline Salt
Gum Tragacanth	French Talc
Gum Arabic	Glycerine
Gum Karaya	Verdigris

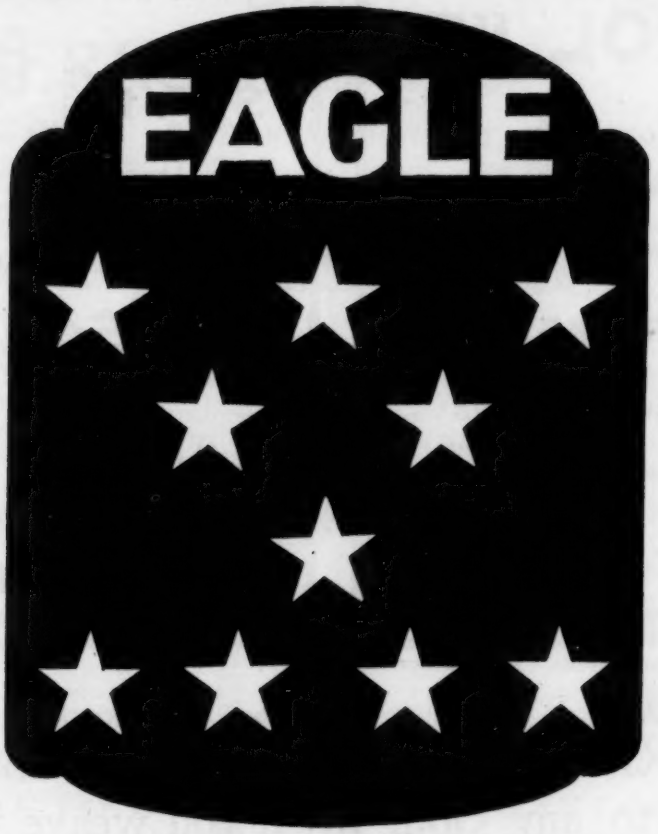
Olive Oil Commercial
Imported Zinc Oxide

Inquiries Solicited

A. KLIPSTEIN & CO.

644 Greenwich Street, New York City

Starch



—and these stars have a meaning—

They signify the different grades in which Thin Boiling Eagle Starch is offered to the textile industry.

Being the pioneers in the manufacture of **Thin Boiling Starches** we are gratified at the widespread recognition they have received.

Be sure to select the grade best suited to your work. Our knowledge and experience is at your service.

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

"BRETON" MINEROL "F"

For

Cotton Print Goods

"It prevents foaming in the color box"

BORNE, SCRYMSER CO.

Established 1874

80 South Street, NEW YORK

BOSTON **PHILADELPHIA**

Works: Elizabethport, N. J.

SURPASS CHEMICAL CO. INC. ALBANY N.Y. AUTOGYP PATENTED IN U.S.A. SEPT. 10 1918 IN CANADA OCT. 10 1918

Bleaching **Dyeing**

With this Two-in-One Process

YOU SAVE

- 30% of Labor
- 90% of Water
- 50% of Steam
- 25% of Tensile Strength
- 3½% of Shrinkage
- 4 to 17 Hours Time

Forget about the bleaching process. Use the AUTO-GYP Process of Dyeing which not only simultaneously dyes to shade and eliminates all specks, motes, leaf and shives, but makes great savings—see figures above.

These figures are not guesses, but results from actual tests. They will at once be recognized by any practical mill man who instead of bleaching cotton and cotton goods preliminary to dyeing uses the AUTO-GYP PROCESS which in addition to dyeing, removes all specks, motes, shives, etc., in one bath.

If such economies interest you, let us prove them by actual demonstration with your own goods and your own equipment. Write for complete information today.

SURPASS CHEMICAL CO., Albany, N. Y.

AUTO GYP
Process of Dyeing

DRAW-IN only one time and change to any cloth when you weave with

"DUPLEX"

FLAT STEEL LOOM HARNESS

STEEL HEDDLE MFG. CO.

GREENVILLE **PHILADELPHIA** **PROVIDENCE**

Southern Office

111 Washington St. :: **Greenville, S. C.**

Hampton Smith, Southern Manager.

N. B.—We are sole manufacturers of Nickle-Plated Drop Wires for every kind of loom.

Pat. Applied for

SPUR-CAP SHELLS

Made to Stand the Hard Knocks

MANUFACTURED BY

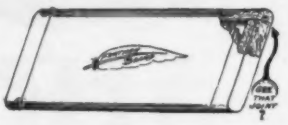
GALLAUDET AIRCRAFT CORP'N.,

EAST GREENWICH, R. I.

FEATHERBOARD

The Master Cloth Reel

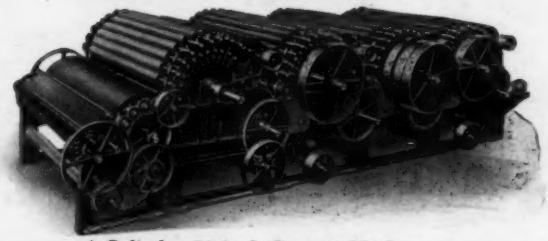
LIGHT AND STRONG. IMPROVES YOUR PUT UP.



SMITH & FURBUSH MACHINE CO.

PHILADELPHIA, PA.

A Garnett Machine of this size will reduce to fibre hard twisted thread waste without materially shortening the staple. We also build smaller machines for working soft washes.



4 Cylinder 30-inch Garnett Machine.

This Garnett is built on our own sectional unit frame construction and contains many improvements which we will be glad to explain.

Ask for Circular S-182.

TWENTY YEARS OF PROGRESSIVE SERVICE

Has given us a Reputation that covers the Southland.

Our present large and highly efficient organization is evidence of the Satisfaction we have given.

From the very first our Standards of Quality and Workmanship have been of the Highest.

We are the South's Pioneer Manufacturers of FLYER PRESSERS, made of the very Best Norway Iron. These are Perfectly Fitted before leaving the Factory.

WE MANUFACTURE

Repair, Overhaul all kinds of Textile Machinery, Align and Level Shafting by the Kinkead System.

ESTIMATES FURNISHED.

Southern Spindle & Flyer Company

Charlotte, N. C.

W. H. Monty, Pres. & Treas. — W. H. Hutchins, V.-Pres. & Sec.

THE

"Southwestern Iron Clad"

Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through all principal distributors.

The Southwestern Broom Mfg. Co.

Evansville, Indiana

FIG.20.

Heavy Duck. Renewable Hardwood Shoes. Leather-bound rim.

LANE

CANVAS BASKETS

FIG.27.

Smooth surfaces. Light handling. Thread-guard Casters. Great durability.

Point the way to

Ultimate Reduction

of

Operating Costs

W. T. LANE & BROTHERS, Manufacturers **Poughkeepsie, N. Y.**

Your TOP FLAT BRUSHES

should be refilled. Our repair department has been greatly enlarged. We can do your REPAIR WORK on the shortest possible notice. Satisfaction Guaranteed.

Estimates Gladly Furnished.

Garvey Stencil and Marking Ink

comes ready for use. A non-evaporating MARKING INK which it is impossible to rub off.

We are Sole Distributors.

WHEN BUYING BRUSHES

There are three points you should consider

PROPER DESIGN
QUALITY OF MATERIAL
LIFE OF BRUSH

In the perfecting of each of these features we have spared neither trouble nor expense.

Our factory is the finest in the South. Our workmen are Experts and the Materials used are the BEST OBTAINABLE.

We have been manufacturing TEXTILE BRUSHES since Nineteen and Twelve.

HAVE YOU BEEN USING THEM?

We have a catalog that tells a lot about BRUSHES you should know.

THERE'S ONE WAITING FOR YOU.

Atlanta Brush Co.

Successors to

D. D. Felton Brush Company

Central and Trinity Aves.

ATLANTA, GA.

Are Your Floors CLEAN ?

They can't be unless you use a **SYSTEM** *that* **CLEANS**

300 Great Textile Mills Maintain CLEAN FLOORS with the FINNELL SYSTEM OF POWER SCRUBBING!

Write for Information

AMERICAN SCRUBBING EQUIPMENT CO.

Also Manufacturers of Finola Scouring Powder

General Offices and Factories: Hannibal, Mo.

DISTRICT OFFICES

ATLANTA
BALTIMORE
BOSTON
BUFFALO
CHICAGO
CINCINNATI
CLEVELAND
DENVER
DETROIT
INDIANAPOLIS
KANSAS CITY
LOS ANGELES
LOUISVILLE
MILWAUKEE
MINNEAPOLIS
NEWARK
NEW ORLEANS
NEW YORK
OMAHA
PHILADELPHIA
PITTSBURGH
PROVIDENCE
ST. LOUIS
SALT LAKE CITY
SAN FRANCISCO
SEATTLE

Shambow Shuttles

RE-INFORCED with Red Vulcanized Fibre will outwear the best plain wooden Shuttle two in one and increase loom production and maintain, if not actually improve, quality. They will prevent an end an hour per loom from going down. Figure this out in additional loom hours added to your present producing capacity.

We are Southern Distributors for the SHAMBOW SHUTTLE CO., of Woonsocket, R. I., and maintain in Atlanta a complete Service and Advisory Department, in charge of Mr. A. W. Angell, a direct Factory Representative, whose entire time is at the disposal of the Southern Textile Mills, to help reduce your Shuttle troubles to a minimum. Let us explain to you the advantages of using Shambow Fibre Re-inforced Shuttles and Picker Sticks.

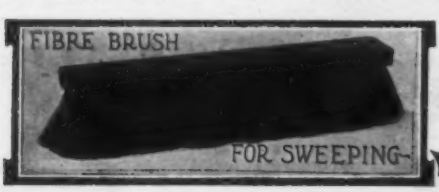
The **WALRAVEN** *Co.*

Machinery and Mill Supplies. ATLANTA, GA.

A Clean Sweep

Can be made only with a good sweep. A clean job of scrubbing can be done only with a good brush. The "Two-in-One" Combination Sweep and Scrubbing Brush is made strong of the best materials and stands hard usage and lasts longer than other brushes, with the added advantage that new bottom brushes may be purchased at reasonable cost, the handle and top being practically indestructible. Used as a scrubbing brush the operator stands up, permitting faster work than with the old-fashioned hand brush. It is more effective and robs the task of scrubbing of its unpleasant features.

SOUTHERN BRUSH AND BROOM COMPANY



501 Citizens and Southern Bank Bldg.
ATLANTA, GEORGIA.

FORTY-FIVE YEARS MANUFACTURING HIGHEST GRADE CLEANING POWDERS
INDIA ALKALI WORKS BOSTON

For Clean Cleaning of Mill Floors

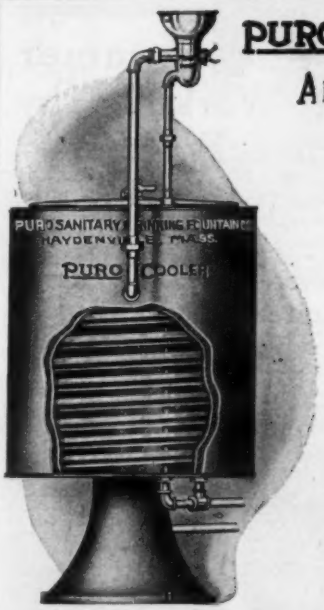
SAVOGRAN

Is INDISPENSABLE
Likewise ECONOMICAL

A Trial Order will Convince

INDIA ALKALI WORKS BOSTON, MASS.

PERBURCo
Phone
Ivy 5522
Phone
Ivy 5522
HOSPITAL EQUIPMENT
Our Equipment is acknowledged by the profession and leading authorities as the last word in quality, convenience and efficiency.
You can't go wrong by specifying our equipment for first aid rooms and village hospitals. We will be glad to send our experts to advise with you and install the equipment best suited to your needs.
Our new catalog gladly sent on request. Write for it.
Expert Truss Fitters
Perryman-Burson Co.
ATLANTA, GA.
23 Houston St. Near Candler Bldg.



PURO SANITARY DRINKING FOUNTAINS ARE NO LONGER A LUXURY

The up-to-date manufacturer found out that they are time savers—save time by reducing loss of time on account of sickness among your employees—and save time by having a cool drink of pure water available at all times.

PURO Drinking Fountains are cast bronze metal—beautifully nickel plated—so simple that even a child can operate them—yet—there is nothing to get out of order.

For Your Own Protection Install PURO Sanitary Drinking Fountains.

Southern Sales Manager
E. S. PLAYER
Masonic Building
Greenville, S. C.

Manufactured Exclusively by

PURO SANITARY DRINKING FOUNTAIN CO.

HAYDENVILLE, MASS., U. S. A.

The Palmer Adjustible Thread Guide

For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

GIRLS LIKE LYON LOCKERS

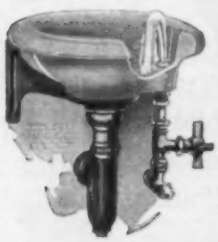
Bulletin 204 on request

SIMPLY a straight pull on the handle opens the door, a push and it closes and latches —the full loop hinge and an extra strong door and frame insure a smooth operating door that cannot sag or bind.

Quality appeals to the exactness of the feminine mind, as well as lengthens the life of the lockers.

Lyon Metallic Manufacturing Company
AURORA, ILLINOIS

The VERTICO-SLANT



Is a practical solution of the drinking fountain problem, with its stream of minimum slant—the stream that cannot be contaminated.

Lips cannot touch the nozzle, which is raised only slightly above the sloping base of recess. The copious drinking feature of the vertical stream is retained in the Vertico Slant, as the mouth comes in contact with the stream at a point where it loses its momentum.

Glass or cup can be filled easily from this stream.

The fountain that prevents squirting, tampering or pilfering, and uses less water than the average old-style globe shaped drinking fountain.

The ideal fountain for hospitals, offices, factories, picnic grounds, etc.

RUNDLE-SPENCE MFG. CO.
MILWAUKEE WIS.

Maintain The Summer Efficiency of Workmen by Cool, Pure Water

Bottled water and paper cups run into a lot of money but here's how you save all this and get the best results

Twentieth Century Sanitary Ice-Cooled Bubbling Fountains

are for attachment to city water supply and they supply ice-cooled water which is much more sanitary than "ice-water."

They hold 75 pounds of ice—will supply 50 to 75 people. Self-cleaning, do not harbor germs, use less ice than ordinary water coolers—are durable in construction and attractive in looks.

Our Bubbler Heads are absolutely non-squirting and give forth a steady, easily-regulated stream.

Send for complete catalog and prices.

Twentieth Century Brass Works
Belleville, Ill.

A Comparison of Drinking Fountain Streams

Vertical Stream Bubbler Condemned Everywhere — Camouflaged Vertical Stream — Rainbow stream. Hose-like. difficult to drink from.

No. 1 shows the vertical stream which permits saliva and waste water from the drinker's mouth to fall back to the source of supply. No longer considered sanitary.

No. 2. is a slight modification of vertical stream type. This slight angle is little if any improvement over No. 1.

No. 3 is more sanitary if properly used. But stream is hose-like with no definite drinking point. Drinker places mouth as near water outlet as possible. Unsanitary like Nos. 1 and 2.

The Puritan Cantonment "Mound Building" Stream

Practical drinking mound is formed by mechanical means. Interference is set up in stream which retards water movement at the apex of arc. This stream makes it impractical to drink from any other point. Approved by U.S. Government. Now recognized by largest interests and schools in the country.

—Definite Drinking Point.

—Sanitary and Practical.

Puritan CANTONMENT DRINKING FOUNTAINS

Puritan "Cantonment" Coolers are designed to connect to pressure lines and are so constructed that the drinking water does not come in direct contact with either the ice or ice water, but is circulated through brass coil which is tinned both inside and outside.

With 2-stream "Mound Building" Projector this cooler is the most efficient and sanitary of its kind on the market.

WRITE FOR ILLUSTRATED LITERATURE NOW.

Halsey W. Taylor Company
Warren, :: :: :: Ohio

BUBBLING FOUNTAINS

Ice and Water Cooled

INVESTIGATE THE NEW IDEA

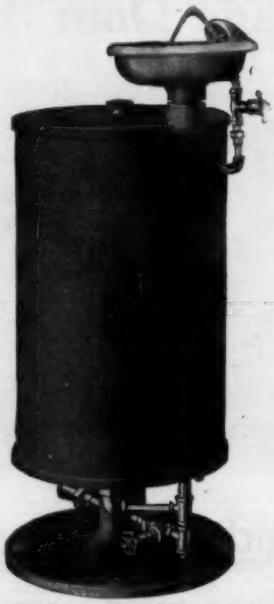
This is one of many Types.

—

Last word in Ice-Cooled Fountains

—

TWO TANKS —Ice in one and waste cold water from Bubbler in the other



Our Lines Cover:

Sanitary Wash Bowls (in batteries), Bubbling Fountains (plain and ice cooled), Metal Lockers, Metal Stock and Pattern Storage Racks, Metal Shelving, Metal Cabinets, Vault Fixtures, Soda Kettles (40 and 60 gallons), Metal Stools and Chairs, Water Mixers, Work Benches, Bench Legs, Full Line of Plumbing Fixtures, etc.

Send for Complete Catalog.

Manufacturing Equipment & Engineering Co.
136 FEDERAL STREET, BOSTON, MASS.
Works and Mail Address: Framingham, Mass.

Painting

LET us furnish estimates on your painting. We can refer you to scores of big mills throughout the United States that we have painted.

Write or phone us today.

H. NEWTON MARSHALL CO.
CONTRACTING PAINTERS
ATLANTA, GA. BOSTON, MASS.
D. R. Hall, Southern Manager
501 Trust Co. of Ga. Building, Atlanta, Ga.

Slidetite

Garage Door Hardware

THERE IS ONLY ONE

SLIDETITE

There is only one way for the man who wants a highly satisfactory garage door to get what he wants—by installing **Slidetite,** a sliding folding door arrangement. It makes any garage door easy of operation. **Slidetite** has many imitators, but no equals. Here is the easy-to-operate garage door you have been looking for.

Write today for our catalog.

Richards-Wilcox Mfg. Co.
A Hanger for any Door that Slides
CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA
AURORA, ILLINOIS, U.S.A.
BOSTON NEW YORK CLEVELAND INDIANAPOLIS MINNEAPOLIS LONDON, ONT. SAN FRANCISCO

VOGEL
PATENTED

FROST PROOF CLOSETS

They require no pit.

They save water.

All bowls have enameled rims. In service daily, winter and summer.

No. 1

OVER 350,000
Giving
Satisfaction in All Climates

The ideal water closets for Factories and Mill Villages, where thousands have been installed.

The most durable water closets made — excepting none.

Every Fixture Tested Under Hydraulic Pressure Before Leaving Factory.

INSIST ON GETTING THE VOGEL

Ask your jobber

JOSEPH A. VOGEL CO.

Factory and Office at
WILMINGTON, DEL.

VOGEL
PATENTED

No. 5 FACTORY CLOSET

This fixture fills the demand for a strong and durable automatic water saving closet outfit for factory use. The valve device is extremely simple and repairs, though seldom necessary, can be made by removing the valve cap back of bowl.

Notice how the Armco Iron hollow post fits down over the base casting (which is electro zinc plated), shedding all water and preventing rust. An exclusive SANYMETAL feature.

Sanymetal Stands Dry-Shod

ONE of the things that makes SANYMETAL Toilet Partitions stand solid and unshaken after years of service is the waterproof shoe with which every post is shod—a special design of base casting which sheds the water and prevents the rusting which makes short work of ordinary partitions.

Then, to make doubly sure, every

Sanymetal
TRADE-MARK U. S. REG.

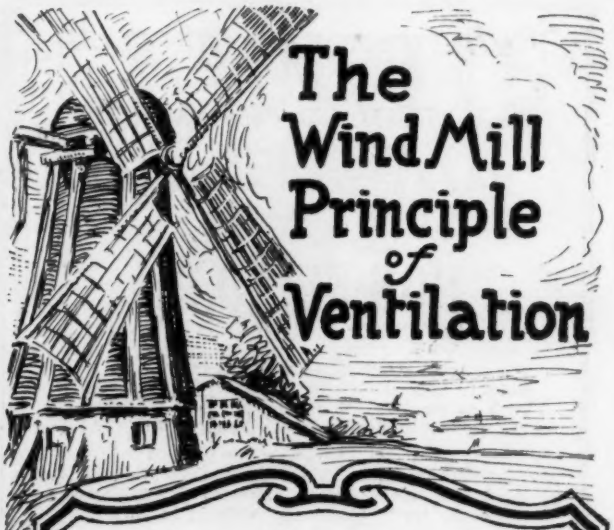
base casting is electro zinc plated by our own government-test process. It can't rust.

This is another reason why SANYMETAL is the superior partition—at a moderate price. It outwits the rust-wolf at every corner. It will outlast the building in which you install it.

THE **Sanymetal** PRODUCTS COMPANY
TRADE MARK U.S. REG.
980 East 64th Street - Cleveland, Ohio

SEE OUR CATALOGUE IN SWEET'S

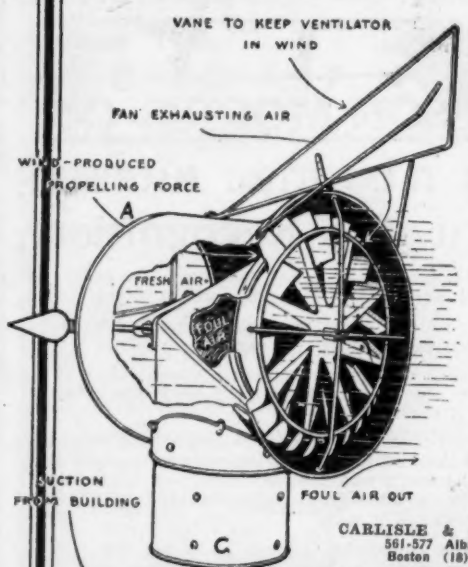
All doors are equipped with SANYMETAL Gravity Roller Hinges. SANYMETAL is made for every possible partition need.



Perfect Ventilation With No Expense for Power

THIS patented method of ventilation has proved far more efficient than any other on the market. Tests have shown that the Carlisle displaces from four to six times as much air as ordinary ventilators.

Free air is the power that operates the Carlisle Force Draft Ventilator. The air passing through the funnel comes in contact with the smaller outer blades, thereby propelling the wheel to which the larger inner blades are attached. These revolving inner blades create a powerful suction which draws the foul air from below.



A continual supply of pure, fresh air is furnished and maintains the efficiency of your operatives throughout the entire day.

Fewer smaller sized Carlisles will do more work than your present ventilators, and insure positive and CONSTANT ventilation. They are durable, storm proof, trouble-proof.

Write for folder.

CARLISLE & GALE CO.,
561-577 Albany St.
Boston (18) Mass.

CARLISLE Force Draft Ventilators

"A No. 00000 Grade NON-FLUID OIL

Saves Trouble and Costs the Mill Less for Lubrication."

Said an Experienced Operator About the "All Purpose Grade"—A No. 00000

NON-FLUID OIL

When A No. 00000 NON-FLUID OIL is used you don't have to keep a number of different oils on hand, such as machine oil, motor oil, loom oil, shafting oil, etc.—it replaces all of these.

And it saves the operator's time because it lasts longer than liquid oil—anywhere from three to five times—giving better, more positive lubrication —because its lubrication quality lasts longer.

Like all other NON-FLUID OILS, it won't throw—or drip—saving time and money in diminished oil stains on goods.

Shall we send that sample?
It's ready for you now.

Ample stocks always at our branches

Charlotte, N. C. Atlanta, Ga. New Orleans, La.

New York & New Jersey Lubricant Company

401 Broadway, New York

ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING

Best for Every Type of Belting
Nothing Needed But a Hammer
The Strongest Belt Lacing On Earth
Double Staggered Teeth Insure Strong and Firm Grip
"Never Lets Go"

The Choice of Master Engineers

ALLIGATOR Steel Belt Lacing is specified by Master Engineers the world over, because they have found it the most simple, efficient and economical medium for lacing all belts from tape to ⅝-inch thickness. Only a hammer required to apply it. Three minutes average time makes a permanent, flexible joint, with two working surfaces, that is stronger than any other known.

Investigate Alligator's Service Advantages. ALLIGATOR Steel Belt Lacing is sold by all good dealers and belting houses. Ask your preferred dealer, or write us for samples and prices.

Send for This Free Book

Our new book, "Short Cuts to Power Transmission," sent free upon request. Now in use in many technical and engineering schools. Every user of belting should have a copy. Write today for this valuable book.

FLEXIBLE STEEL LACING CO.

Manufacturers also of the famous FLEXCO-LOK Steel Lamp Guards.

4619 Lexington Street, Chicago, Ill., U. S. A.
135 Finsbury Pavement, London, E. C., England

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY

ENGINEERS—FOUNDERS—MACHINISTS

PHILADELPHIA, PENNA.

Branch Office, 141 Milk St., Boston, Mass.

20

EVENER LAPS MAKE EVENER WORK

The bearing friction of apron and evener rolls causes the evener belt to slip. This makes a thin place in the lap.

Put ball bearings on the evener and apron rolls and eliminate the friction that causes belts to slip, and you will get a much more uniform lap.

The installation is simple, and the cost slight.

AldricH MachinE

Ball WorkS Bearings

Greenwood, S. C.

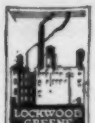
Your plant is worth --?

THERE is a potent reason for the many plant appraisals that have been made recently.

The present commercial era is one of change and uncertainty. Tumbling prices, difficult wage adjustments, unstable markets, these and other infirmities obscure the true condition of industry. And it is proportionately difficult to determine the present worth and future possibilities of the individual plant.

Appraisals made but a few years ago are misleading now—they will be more so in the near future. An appraisal made today should include not only an accurate valuation of buildings, machinery and equipment, but also a dependable estimate of the development of the plant and the industry at large.

The industrial valuation service of Lockwood, Greene & Co., combining the opinion of experienced engineers and owners of industrial plants, is especially adapted to the present peculiar business conditions. It considers such important questions as labor and transportation conditions, present and future value of patents, a study of processes and marketing capacity and the value of the component parts of the plant for their intended purpose.



BUILDING WITH FORESIGHT

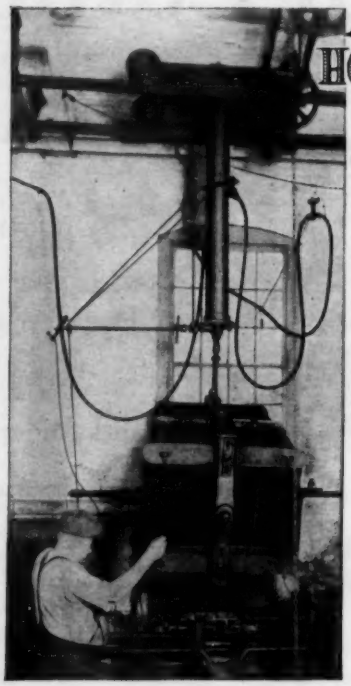
This comprehensive, dependable service is available to every manufacturer, regardless of location, for each of our offices has facilities to make a thorough valuation of your plant.

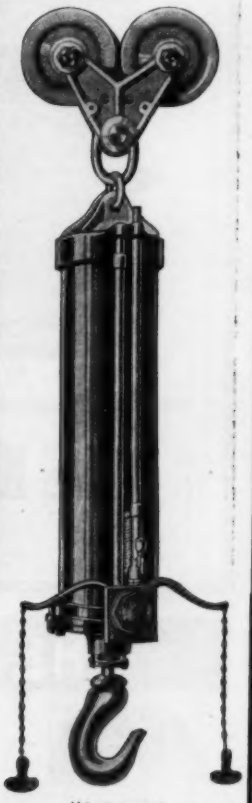
LOCKWOOD, GREENE & CO.
ENGINEERS

EXECUTIVE OFFICE, 60 Federal Street, BOSTON

BOSTON ATLANTA CHICAGO NEW YORK
DETROIT CLEVELAND CHARLOTTE PHILADELPHIA
SANTIAGO, CHILE
LOCKWOOD, GREENE & CO. OF CANADA, LIMITED, MONTREAL
COMPAGNIE LOCKWOOD GREENE, PARIS, FRANCE

CURTIS AIR HOISTS





Used In The Textile Industry

"Lift it with air

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

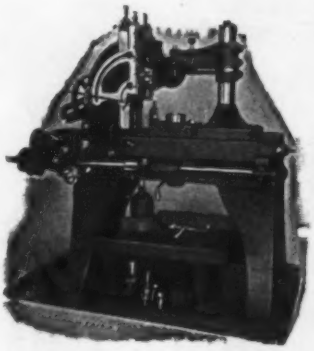
Curtis Pneumatic Machinery Co.
1571 Kienlin Ave. St. Louis, Mo.
Branch Office
532-R Hudson Terminal New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
C.P.M.Co.

Established 1854

FULL AUTOMATIC, SEMI-AUTOMATIC and HAND OPERATED

Gear Cutting Machines!

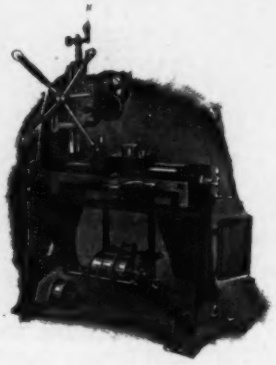


Especially Adapted for Use in

Cotton Mills.

Hundreds Now in Use.

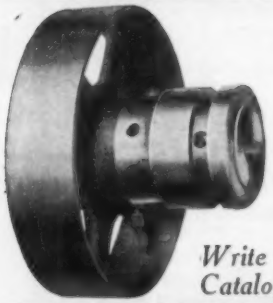
Send for special circulars.



The D. E. Whiton Machine Company

New London, Conn.

THE JOHNSON FRICTION CLUTCH



Write for our Catalog G.

FRICTION CONTROL MEANS BETTER MACHINERY

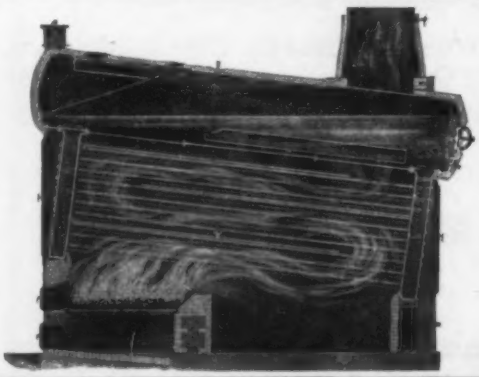
And we specialize in applying the proper type of friction clutch to meet any conditions.

In the textile plant, the highest efficiency in power transmission lies in the group drive from lineshaft with Johnson Clutch Control. Eliminate your inefficient countershafts and expensive individual motors.

Adopt the Johnson Lineshaft Drive

Johnson Clutches are available from stock in standard sizes, single and double, to fit all shaft and pulley dimensions.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.



TUBULAR **BOILERS** WATER TUBE

STEEL CASINGS — TOWERS — TANKS

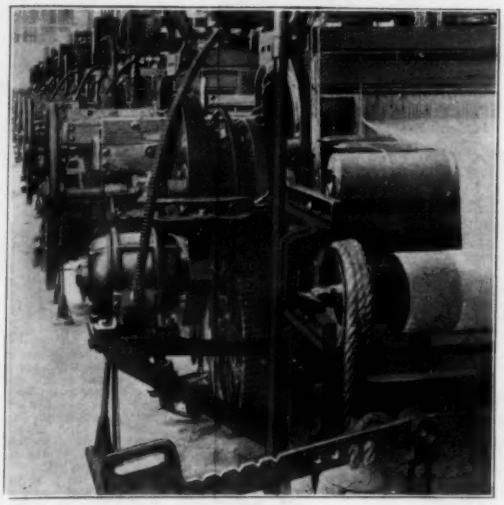
Our IMPROVED STEEL CASINGS fitted to your Boilers will save you from 10% to 25% in fuel.

WRITE FOR OUR NEW CATALOGS

THE WALSH & WEIDNER BOILER CO.

CHATTANOOGA, TENN.

NEW YORK SAN FRANCISCO NEW ORLEANS MEMPHIS HAVANA JACKSONVILLE



Allis-Chalmers

Loom Motors

Especially Rugged Design

A complete line of totally enclosed Motors having waste packed bearings.

Ratings 1-3, 1-2, 3-4, 1 and 1 1-4 H. P.

ALLIS-CHALMERS

MILWAUKEE. WIS. U. S. A.

Speed in Service is Only Rivaled by Accuracy
Each Would Be Useless Without the Other

Unfailing Service

In the struggle and stress of modern business life every moment of delay represents a loss of time and money which cannot be regained.

When promptness, accuracy and dispatch are the vital elements in the delivery of electric equipment or supplies it is natural to turn to the Carter Electric Company for service.

This is an organization whose members are trained to meet the demands of any emergency and this organization is ready to serve you on an instant's notice.

If your requirements cover Rubber Conduit Wire, Switches, Safety Switches, Wiring Devices, Fuses, Lamps or other electric supplies, it is only a matter of a few hours before we can place them in your hands.

This is because our warehouses are always fully stocked—everything you may need and in large quantities—and with every modern facility for handling your business the Carter Electric Company pledges you **Unfailing Service.**

Carter Electric Company

63 Peachtree Street, Atlanta

Diamond·F

Condensite Celoron Silent Gears

Every industry may now have silent gears —gears that are water, oil and greaseproof— self-supporting, vulcanized fibre gears that require no shrouds or end plates—tough, strong, waterproof vulcanized fibre gears that will give service in places and under conditions where the average silent gear could not survive.

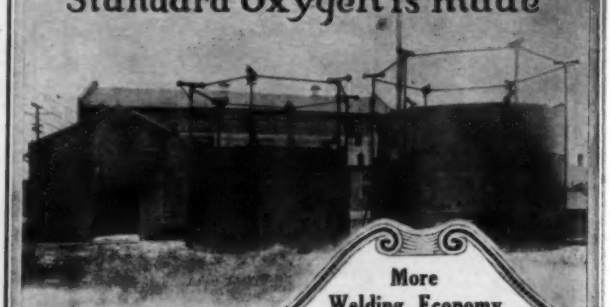
Condensite Celoron gears will stand up and give service under the most trying conditions because they are almost as strong as cast iron and far more resilient. Equal to sudden shock or heavy strain. They save money, too, because they save power, make a more quiet plant, better working conditions, more contented workmen and speed up production generally.

Most all good gear cutters can supply you with Condensite Celoron gears or pinions. Or, we will gladly send you the names of gear cutters in your neighborhood who will be glad to help you. Write us today.

Diamond State Fibre Company

Bridgeport (near Philadelphia), Pa.

One of the Plants where Standard Oxygen is made



More Welding Economy

STANDARD is the first company in the South to manufacture oxygen and satisfaction is insured by prompt shipments, full measure and absolute purity of oxygen. This satisfaction is attested to by the fact that our business has increased over 800% in the last two years. Hundreds of mills are now using Standard Welding Apparatus and Supplies.

Our representatives will be glad to call and explain in full and make a demonstration of STANDARD Apparatus in your own shop. No obligation. Write for catalog.

Order your oxygen from our station nearest you.

Standard Gas Products Co., Inc.
Atlanta, Chattanooga, Gretna, La.

STANDARD OXYGEN
WELDING APPARATUS & SUPPLIES

QUICK WELDING SERVICE

Welding a cylinder, 2000 lbs. and cylinder head 3 inches thick weld 20 inches—for Block Coal Co., Block, Tenn.

DON'T DISCARD YOUR BROKEN PARTS OUR SERVICE SAVES TIME AND MONEY

There is no need of discarding broken machines and machine parts—there is no need of shutting down and waiting an indefinite length of time for delivery of new parts.

Many mills know through experience that should a machine breakdown occur, it can be put back in operation quickly by calling on AUTOGENOUS.

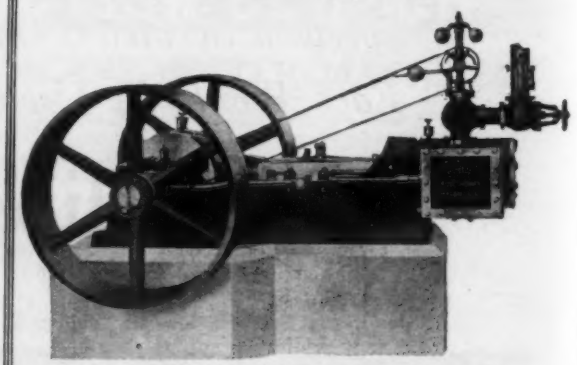
We have just completed the repair on the crosshead and main bearing of a 1200 H.P. engine for the Brookside Cotton Mills. Practically every cotton and knitting mill in the vicinity of Knoxville has taken advantage of and profited by AUTOGENOUS Welding Service. Many of these jobs were extra large and caused a shutdown of the plant, and much time was saved by our quick service.

No matter how bad the break, no matter how small or large the machine or part, AUTOGENOUS Welding Service can save you money.

Full Details Sent on request. Wire, Phone or Write

AUTOGENOUS WELDING CO.

Oxy-Acetylene and Cutting in All Metals.
903-5 No. Central Ave., Junction Central and Broadway, Knoxville, Tenn.



J. S. Schofield's Sons Co.

Macon, Georgia

MANUFACTURERS OF

High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

Heavy Castings and Wrought Iron Works.

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

The Recognized Standards of Quality
COTTON YARNS

Gray Manufacturing Co.
Arrow Mills, Inc.
Parkdale Mills, Inc.
Flint Manufacturing Co.
Arkray Mills, Inc.
Arlington Cotton Mills
Myrtle Mills, Inc.

Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness, and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

30s to 80s Single and Ply Combed Peeler Right Twist. 30's to 50's Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

Our products are sold direct and exclusively through our General Sales Offices:
225 Fifth Avenue at 26th Street, New York.
H. A. FLORSHEIM, Sales Manager
Long Distance Phone: Madison Sq. 7666-7-8 and 9.
BRANCH OFFICES { Boston, Philadelphia, Chicago

GRAY QUALITY YARNS Gray Manufacturing Co. Gastonia, N.C.

ARROW MILLS COMBED YARNS GASTONIA, N.C.

MYRTLE MILLS INC. COTTON YARNS GASTONIA, N.C.

PARKDALE MILLS, Inc. PARKDALE YARNS ARE THE BEST GASTONIA, N.C.

ARLINGTON COTTON MILLS COTTON YARNS GASTONIA, N.C.

FLINT MFG. CO. GRADE FLINT GASTONIA, N.C.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF

Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

HUGHES FAWCETT

IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes.

TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK

J. H. LANE & CO.

334 Fourth Avenue

NEW YORK

Selling Agents for
Cotton Mill Products

BOSTON CHICAGO

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER EDGAR H. BRIGHT

J. WILLIAM BARKDULL C. MORGAN ABRAMS

MEMBERS OF

New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

The BANK
that is *closest*
to the heart of
New England Industry

The NATIONAL SHAWMUT BANK
of Boston

CARVER-BEAVER YARN CO.
Successors to A. D. SALKELD & BRO., Inc.
ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED
366 BROADWAY, NEW YORK

ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the sellers' profits.

1865 Oldest National Bank in the Cotton States 1921

The Atlanta National Bank

And

How and Why Business Is Improving

OFFICERS
ROBERT F. MADDOX
President
VICE PRESIDENTS
James S. Floyd
Geo. B. Donovan
Thos. J. Peeples
ASSISTANT CASHIERS
D. B. DeSaussure
R. B. Cunningham
Jas. F. Alexander
Leo Stillman
A. N. Anderson
J. S. KENNEDY, Cashier
DIRECTORS
W. L. Peel
R. F. Maddox
Albert E. Thornton
E. H. Inman
J. J. Spalding
Alfred Austell
S. C. Dobbs
Jas. L. Dickey
J. S. Floyd
Geo. B. Donovan
J. T. Holleman
Lloyd B. Parks
J. Epps Brown
Dr. W. S. Elkin
Wm. J. Davis
H. B. Durand
S. Y. Tupper

Newspapers, trade papers and financial writers in all sections of the United States have reported during the past week that—

BUILDING IS MORE ACTIVE.

RETAIL TRADE IS INCREASING.

LUMBER DEALERS REPORT FREE BUYING.

THE SILK TRADE HAS REVIVED SUBSTANTIALLY.

LEATHER AND HIDE MARKETS ARE BETTER, AND LEADING SHOE FACTORIES are very busy.

STEEL MILLS DECLARE THAT THE WORST IS OVER, AND THAT THEY anticipate heavy buying during the early fall.

COTTON PRICES HAVE STIMULATED THE SELLING OF SURPLUS STOCKS, turning no small amount of money into all channels of Southern trade.

FERTILIZER DEALERS IN CLOSE TOUCH WITH SOUTHERN FARMERS SAY that the enormous saving at which the 1921 crop has been raised will enable farmers to pay every cent of their 1921 indebtedness, and make substantial reductions in the balance carried over from last year.

As the South was the first section to feel the depression caused by liquidation and deflation, so will it be the first to recover, and THE ATLANTA NATIONAL BANK CONFIDENTLY PREDICTS A STEADY, IF GRADUAL, RETURN TO THE SOUTH'S PROGRAM OF DEVELOPMENT AND PROSPERITY.

The Atlanta National Bank

Active Designated Depository United States Government, State of Georgia, City of Atlanta and County of Fulton

IF YOU NEED BANKING SERVICE

in the South,
and especially in Georgia

You need The Citizens & Southern

Capital and Surplus $4,500,000

The Citizens & Southern system has completely equipped offices in Atlanta, Savannah, Macon and Augusta.

Each of these offices is connected with the others by direct private wires.

If you are a customer of either office, and want information or service of any kind from the other cities these wires and the complete organization are at your service.

Hundreds of direct correspondents all over the South make it possible to give you practically the same service wherever you want it.

The Citizens & Southern Bank

Atlanta—Marietta at Broad

Savannah Macon Augusta

"No account too large, none too small"

SUMMER TRAIN
TO THE
"LAND OF THE SKY"
VIA
SOUTHERN RAILWAY

Leave Atlanta 9:15 P. M.
Arrive Asheville 7:30 A. M.

Connection at Asheville for other points.

Make your reservation early

City Ticket Office

Broad and Walton Streets **Phone Ivy 1961**

World Wide System of Banking Service

In addition to technical phases of foreign banking, the National Bank of Commerce in New York offers a broad service to those engaged in foreign trade.

From its own files this bank is prepared to furnish reliable information concerning the character and credit standing of large commercial houses of the world. Through association with the leading banks of other countries we can obtain special reports covering subjects important to the safe and orderly conduct of international business.

National Bank of Commerce in New York

Capital, Surplus and Undivided Profits Over Fifty-five Million Dollars

The American Audit Co.

F. W. LAFRENTZ, C. P. A., Pres. Telephone Ivy 869
H. M. RICE, C. P. A., Vice-Pres. Cable Address
A. F. LAFRENTZ, Secy. & Treas. Amdit, New York

NEW YORK—100 Broadway (Home Office).
33rd St. and 5th Ave., Waldorf-Astoria.
ATLANTA BRANCH—1013-1017 4th National Bank Bldg.
CHICAGO—Marquette Building.
BOSTON—P. O. Square Bldg.
PHILADELPHIA—Bellevue Court Bldg.
BALTIMORE—Garrett Bldg.
WASHINGTON, D. C.—Colorado Building.
NEW ORLEANS—Maison Blanche.
RICHMOND, VA.—American National Bank Building.
LONDON, E. C.—50 Gresham St., Bank.
MILWAUKEE—Loan & Trust Bldg.
SCRANTON—County Bank Bldg.
Specialists in Cost Systems and Manufacturing Accounts.

C. B. BIDWELL, P. A., Resident Vice-President

BUYING A PIG IN A POKE

The buying of advertising space used to be buying "a pig in a poke." The quantity and quality of circulation was shrouded in mystery and often the bag was tied against investigation.

That day has passed. The advertiser no longer depends on "mere claims." The Audit Bureau of Circulation has untied the strings to the sack and the circulation of the better class of publications is thrown open for the most searching scrutiny.

In buying space in COTTON you are not buying "a pig in a poke." Our A. B. C. statements will stand the analysis of the most exacting investigator.

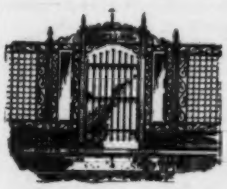
SOUTHERN BUSINESS DIRECTORY

CONSTRUCTION

American Roofing & Paint Co., Inc.
Dealers in
PAINTS, VARNISHES, STAINS,
ROOFING, ROOFING MATERIALS
Roofing Contractors——::——Painting Contractors
Office, 246 Decatur St. P. O. Box 1065
Atlanta, Ga.

SYDNOR'S SUPREME SERVICE

WELL DRILLING
and **DEEP WELL PUMPS**
We do the engineering and have been solving water problems satisfactorily for 25 years for textile mills.
Sydnor Pump & Well Co., Inc., Richmond, Va.



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St., Baltimore, Md.

J. E. ROBBINS & SONS
PRACTICAL WELL DRILLERS
208 W. Coffee St.
P. O. Box 87 Phone: Long Distance 2985
Greenville, S. C.

GOODE CONSTRUCTION COMPANY
GENERAL CONTRACTORS
Charlotte, N. C.

GUDE & CO., Builders
CANDLER BLDG., - ATLANTA, GA.
All classes of buildings constructed promptly and efficiently and at reasonable prices.

FUEL & POWER SUPPLIES

Coal Is Now Moving

Place your order now for our KENTUCKY VELVET LUMP and there will be warmth and good cheer in your home.
Ask some coal expert about this analysis.

Volatile matter	.38	Moisture	1.22
Fixed Carbon	.60	Sulphur	.32
Ash	1.10	B. T. U.'s	14948

We handle the Empire, one of the best mines in Alabama. Also steam and mine run coal from Kentucky and Tennessee.

Truitt Coal and Iron Company
ATLANTA, GEORGIA

Advertising conserves the Manufacturer's time by acquainting him with a service or product at his leisure long before the need for such arises.

CLASSIFIED ADVERTISING

CHECK WEAVERS WANTED

About a dozen check weavers wanted on Crompton two box and four box looms. For further information write Superintendent Lowe Mfg. Company, Huntsville, Alabama.

WANTED

A Master Mechanic by an 11,000 spindle heavy duck cotton mill in the best town in Western Georgia. In replying, state experience and give references. Address Box 41, care COTTON, Grant Building, Atlanta, Ga .

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four words for box address,)

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

Do You Want To Sell It ?

Probably you, like many other mills, have some equipment or machinery which you have taken out, or are thinking of taking out and replacing with new equipment.

Why not dispose of this second-hand equipment at a profit. COTTON is read by thousands of Cotton Mills that are hardly touched by Northern journals.

You Can Sell Your Second-Hand Equipment

to these mills through advertising in the Classified Advertising Section of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement for you.

COTTON

Grant Building, **Atlanta, Ga.**

BUY IT AT OLD HICKORY

Where the Surplus Stocks of Machinery from the Government's $87,000,000 Project Are Being Sold at Surprisingly Low Prices

Sterling Boilers

44—823 H.P. Sterling Boilers, Class M-30, complete with all accessories. Babcock & Wilcox Co., New York, makers. 200 lbs. pressure, 680 3½-inch tubes, No. 10 gauge. 150 of these tubes are circulators. Steam drums double riveted, double strap butt joint, 1-inch rivets. Thickness shell plates and tube sheets in steam drum ⅞ inch, mud drum 1 inch. Space occupied by boiler 18 feet by 22 feet 3 inches by 29 feet 9 inches high.

Stokers—4-S Retort, double dump underfeed stokers, with line shafting, etc., manufactured by Westinghouse Electric Co., Stoker Extension hoppers.

Stoker Engines—8 x 8 Buffalo Forge Co., Vertical Engines, single acting, inclosed, Class A, rated at 32 H.P., 350 R.P.M., equipped with 1-2½ governor, 1--2½ throttle valve, Jenkins Valve Co. Stoker Drive 17 x 20 x 3, silent Morse chain.

Fan and Turbine—1 Turbo-Conoidal Fan, Buffalo Force Co., Type T-D No. 9½ double inlet, 100,000 cu. ft. per minute at 6″ water pressure and 970 R.P.M., driven by 225 H.P. horizontal, multi-stage, non-condensing Moore Turbine and reduction gear. throttle valve 3″. Steam Consumption at 180 H.P. 31-6 lbs. at 225 H.P. 33-2 lbs. Turbine and reduction gear. Manufactured by Moore Steam Turbine Co., Wellsville.

Accessories for Each Boiler.

1—12″ Ashcroft, 400 lb. steam gauge.
4—4½″ Consolidated safety pop valves.
1—3″ Pratt & Gady Feed valve.
2—2½″ Elliott blow-off valves.
1—6″ Foster non-return valve.
1—6″ Vulcan soot blower.
1—Bailey flow meter, rated flow 28,000 lbs. hr., max. flow 70,000 lbs. per hour.

These boilers have been tested under steam pressure but never operated.

Pumps

Motor Driven Centrifugal.

10—14-in. Worthington, Class B, double suction, 8,600 G.P.M. at 152 feet head, at 1,170 R.P.M. direct connected to 300 H.P. General Electric, 3 phase, 60 cycle, 2300 volt, 1700 R.P.M. motors.

4—14-in. Allis-Chalmers, Type S, 7500 G.P.M. at 130 feet head. at 1760 R.P.M. direct connected to 150 H.P. General Electric, 3 phase, 60 cycle, 2300 volt motors.

2—10-in. Allis-Chalmers, Type S, 3750 G.P.M. 150 feet head direct connected to 100 H.P. General Electric, 3 phase, 60 cycle, 2300 volt motors.

3—6-in. A.W.W., 1000 G.P.M. 125 lbs. pressure, direct connected to 150 H.P. Westinghouse, 3 phase, 60 cycle, 2300 volt, 1765 RP.M. motor.

Steam Turbine Driven Centrifugal.

6—16-in. Allis-Chalmers, Type S, 8500 G.P.M. at 90 feet head, direct connected to Type L, 300 H.P., 2000 R.P.M. steam turbine.

6—14-in. Allis-Chalmers, Type S, 6500 G.P.M. at 150 feet head, 8100G.P.M. at 90 feet head. direct connected to 300 H.P. 2000 R.P.M. steam turbine

Steam Actuated Hydraulic.

6—14 and 20 x 7½ x 18 Worthington Compound Duplex outside and pocket plunger, 400 G.P.M. at 300 lbs. pressure.

10—25 and 38 x 4¾ x 24 Worthington Tandem Compound Duplex, outside end pocket, 3600 lbs. pressure, 150 G.P.M. at 20 R.P.M.

2—20 x 12 x 16 Worthington Duplex Underwriter Fire Pumps, 1500 G.P.M., 100 lbs. pressure.

200—New and used boiler feed Worthington Pumps, 3 x 2 x 3, 4½ x 2¾ x 5, 5¼ x 3½ x 5, 6 x 4 x 6, 12 x x 7 x 10.

Corliss Engines

27—18 x 36 Heavy Duty, Allis-Chalmers Corliss Engines, both right and left hand, 125 R.P.M., 350 H.P. 11 ft. x 32 in. Band Wheel, operated on 140 lbs. steam, 1½-in. gauge back pressure double eccentric.

Engines have been used ten days to three months and are practically new.

Transformers

6—600 K.V.A. Westinghouse Transformers (40° C.), outdoor type, 60 cycle, single phase, 600-1200-2400 volt privary, 6300 volt secondary. Complete with oil. Transformers arranged with taps for starting 300 H.P., 2200 volt, 3 phase motors. Transformers on new AIEE rating at 550° C., 750 K.V.A.

27—250 K.V.A. Westinghouse Outdoor Type Transformers, 2300-460 volt, 60 cycle, single phase, Spec. No. 159463-A.

18—250 K.V.A. Allis-Chalmers Outdoor Type Transformers, 2300-230-440 volt, 60 cycle, single phase.

3—100 K.V.A. Westinghouse S.K. Transformers, outdoor type, 6600 volt, 2200-2000, 60 cycle, single phase.

500-H. P. Keeler Boilers

5—500 H.P. Keeler Water Tube Boilers, 160 lb. pressure, Wetzel stokers. Three new, two used 60 days. Immediate delivery. At a bargain.

Steel Tanks

4000 Steel Tanks, all sizes and shapes. 9 x 36, 8 x 36, 8 x 30 Storage Tanks. Weight tanks, with scales. Round storage tanks, with cover of every size. Small Tanks of every size.

Pipe and Pipe Covering

200 Miles of Practically New Pipe.

26,000 ft. 16 in.	6,930 ft. 7 in.
17,300 ft. 14 in.	37,920 ft. 6 in.
9,800 ft. 12. in.	13,870 ft. 5 in.
12,870 ft. 10 in.	21,600 ft. 4 in.
18,335 ft. 8 in.	68,400 ft. 3 in.

Thousands of feet 2½ in. and smaller. Thousands of feet of hydraulic pipe of all weights.

All of this pipe has been above ground, covered and a great deal has never been used, though installed. Can deliver promptly. Will be sold on a tonnage basis.

Thousands of feet of serviceable 85% Magnesia Covering and lagging, all sizes. Large quantity of all sizes cork covering and fittings.

Relaying Rail

600 tons 80 lb. A S C E Section.
1600 tons 67½ Russian Section.
100 tons 25 lb. section.
176 15 ft. Sections, 12 lb. portable track with switches.
Switches, frogs, crossings, Ellis bumping posts.
Track material of all kinds.

Motors

Single Phase, 60 Cycle.

No.	H.P.	Volts
4	⅛	110
1	⅓	110
1	¾	110
5	½	110

Three Phase, 60 Cycle.

No.	H.P.	Volts
11	½	440
2	1	440
3	1½	440
1	1¾	220
20	2	440
5	3	220
13	3	440
1	5	220
39	5	440
3	7½	220
255	7½	440
5	10	440
90	10	440
115	15	440
6	20	440
20	25	440
33	30	440
28	40	440
7	50	440
5	75	440
1	100	440
1	150	2200
2	300	2200

The above motors are standard makes, of various types and speeds.

Send us your specifications; we can fill them.

Belting

Thousands of feet of new Condor and Anaconda Belting in lengths ranging from 100 to 500 ft. in practically all widths and from 2 to 10 ply. Write for Bulletin No. 5.

Plant Sites

Complete factories and plant sites, in the heart of the Central South are now available at extremely low terms. Write our Industrial Department for information.

THE NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENN.

Buyers' Index

Acetylene Welding Apparatus.
(See Welding Apparatus).

Acetylene Gas.
Commercial Acetylene Supply Co.
Standard Gas Products Co.

Accountants.
(See Auditors and Accountants).

Adding Machines.
Monroe Calculating Mch. Co.

Air Brakes.
Allis-Chalmers Mfg. Co.

Air Washers.
American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

Air Conditioning Systems.
(See Humidifying Apparatus).

Albone.
Roessler & Hasslacher Chemical Co.

Alkalies.
(See Dyestuffs and Chemicals).

Aniline Colors.
(See Dystuffs and Chemicals).

Anti-Chlorine.
(See Dyestuffs and Chemicals).

Aprons-Rub.
Smith & Furbush Machine Co.

Architects and Engineers.
Hearne System.
Lockwood, Greene & Co.
Robert & Co.
Spiker & Lose.
Sirrine, J. E.
Tufts Co., Arthur.

Ash Handling Machinery.
(See Coal Handling Machinery).

Asphalt Slate Shingles.
(See Slate Asphalt Roofing).

Auditors and Accountants.
American Audit Co.
Ernst & Ernst.

Auto Trucks.
(See Trucks—Auto).

Automatic Controllers (Temperature).
(See Temperature Controllers.)

Automatic Loom Attachments.
(See Loom Attachments).

Automatic Feeds for Cotton.
Proctor & Schwartz, Inc.
Saco Lowell Shops.
Sargent's Sons Corp., C. G.
Smith & Furbush Mch. Co.
Whitin Mch. Works.

Automatic Guider (Electric).
Blake Electric Mfg. Co.

Backwashers.
Sargent's Sons Corp., C. G.

Automatic Scales.
(See Scales).

Ball Bearings.
Aldrich Mch. Works.
Campbell Mfg. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
S K F Industries.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

Ball Bearing Housings.
Aldrich Mch. Works.
Fafnir Bearing Co.

Ball Bearing Top Rolls.
Campbell Mfg. Co.

dale Band Buckles.
(See Box Strapping & Buckles).

Bale and Box Ties.
Signode System, Inc.

Baling Machines.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Famous Mfg. Co.
Galland-Henning Mfg. Co.
Williams & Sons, I. B.
Hulme, J. S.
Saco-Lowell Shops.

Baling Presses.
(See Presses).

Bandages, Tapes, Etc.
American Textile Banding Co.

Bands.
(See Tapes).

Banding Straps and Buckles.
Signode System, Inc.

Bands (Self-Tying).
Campbell Mfg. Co.

Banks.
Atlanta National Bank.
Citizens & Southern Bank.
National Bank of Commerce In New York.
National Shawmut Bank.

Barometers (Mercurial).
Taylor Instrument Co.

Barrels—Fibre.
(See Fibre Products).

Baskets—Mill.
(See Boxes—Mill).

Bath Cabinet—Shower.
Crane Co.
Manufacturing Equipment & Engineering Co.
Sanymetal Products Co.

Batteries (Elec.).
(See Storage Batteries).

Beams.
Mossberg Pressed Steel Corp.

Beam Dyeing Machines.
Cocker Mchry. & Foundry Co.

Beam Heads.
Mossberg Pressed Steel Corp.

Beaming and Warping Mchry.
(See Warpers and Warping Machinery).

Bearings.
Cresson-Morris Co.
Diamond State Fibre Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
S K F Industries.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Wood's Sons Co., T. B.

Belting.
American Supply Co.
Augusta Mill Supply Co.
Walraven Co.
Williams & Co., I. B.

Belting—Chain Link.
Link-Belt Company.
Morse Chain Co.

Belting—Rope.
(See Rope Transmission).

Belt Conveyors.
Link-Belt Company.
Morse Chain Co.

Belt Dressing.
Jos. Dixon Crucible Co.
Walraven Co.
Williams & Co., I. B.

Belt Fasteners.
Columbus Novelty Mfg. Co.
Flexible Steel Lacing Co.

Belt Lacing.
Augusta Mill Supply Co
Columbus Novelty Mfg. Co.
Flexible Steel Lacing Co
Walraven Co.

Belt Tighteners.
Link-Belt Company.
Williams & Sons, I B
Wood's Sons Co., T. B.

Bench Drawers.
Lupton's Sons, Co., David

Bench Legs (Pressed Steel).
Lupton's Sons, Co., David.

Benches (Park and Playground).
(See Playground Equipment).

Bleacheries.
(See Dyers, Bleachers and Finishers).

Bleaching Kiers.
Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machinery Co., The.

Bleaching Machinery.
(See Dyeing, Bleaching and Finishing Machinery).

Bleaching, Finishing and Sizing Materials.
(See Finishing Materials).

Blowers and Blower Systems.
American Blower Co.
Carlisle & Gale Co.
Carrier Eng. Corp.
Clements Mfg. Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Boards—Fibre.
Diamond State Fibre Co.

Boards—Form.
Pearson, Jos. T.

Bobbins.
Draper Corporation.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.
Shambow Shuttle Co.
Walraven Co.
Whitin Machine Works.

Bobbin Heads.
Diamond State Fibre Co.

Boilers.
International Engineering Works, Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Boiler Feed Water Purification.
American Water Softener Co.
Hulme, J. S.
Norwood Engineering Co.
Permutit Co.
Scaife & Sons, Wm. B.

Boiler Room Fittings & Supplies.
Crane Co.
International Engineering Co.
Lunkenheimer Co.
Nashville Industrial Corp.
Sturtevant Co., B. F.

Boiler Grates and Stokers.
(See Grates and Stokers).

Boiler Graphite.
Jos. Dixon Crucible Co.

Bookkeeping Machines.
Monroe Calculating Mch. Co.

Box Strapping and Tie Buckles.
(See Banding Straps & Buckles).

Boxes—Mill.
Diamond State Fibre Co.
Hightower Box & Tank Co.
Lane & Bros., W. T.
Standard Fibre Co.

Boxes—Packing.
(See Packing Boxes).

Boxes (Steel).
Lyon Metallic Mfg. Co.

Braid.
(See Tapes).

Brake Linings.
Diamond State Fibre Co.

Brazing.
(See Welding).

Brokers—Cotton.
(See Cotton Dealers & Brokers).

Brokers—Stock.
(See Stocks and Bonds).

Brooms.
(See Brushes.

Brushes—Mill.
Atlanta Brush Co.
Harris Broom Co.
Southern Brush & Broom Co.
Southwestern Broom Mfg. Co.

Brushes—Commutator.
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Buckets and Pails—Mill.
Diamond State Fibre Co
Standard Fibre Co.

Buckets—Elevator and Grab.
Link-Belt Company.

Buckles—Cotton Tie.
(See Box Strapping and Ties).

Building Contractors.
(See Contractors).

Buildings—Portable.
Seawell, Luke.

Building Material.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co., The.
Birmingham Slag Co.
Carlisle & Gale Co.
Dowman, Geo.
Dufur & Co.
Lockwood, Green & Co.
Lupton's Sons Co., David
Sanymetal Products Co.
Seawell, Luke.
Southern Cypress Mfg. Asso.

Bungalows.
(See Houses—Ready Built).

Burr Pickers.
Sargent's Sons, C. G.
Smith & Furbush Machine Co.

Bushings.
Diamond State Fibre Co.
Southern Spindle & Flyer Co.
Shambow Shuttle Co.
Walraven Co.

Cabinets.
(See Lockers).

Calculating Machines.
Monroe Calculating Mch. Co.

Calenders.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co.

Calender Rolls.
Campbell Mfg. Co.
Butterworth & Sons Co., H. W.
Roy & Son, B. S.
Textile Finishing Machinery Co.

Calling System—Inter-Telephone.
Carter Electric Co.

Cans—Roving.
Diamond State Fibre Co.
Standard Fibre Co.

Canvas Lugs.
Augusta Mill Supply Co.

Cars and Trucks—Fibre.
(See Trucks).

Carbonizing Machines.
Cocker Mch. & Fdry Co.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Salem Iron Wks.
Sargent's Sons & Co., C. G.
Textile Finishing Machinery Co. The.
Tolhurst Mch. Wks.

Carding Machinery and Supplies.
Howard Bros. Mfg. Co.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

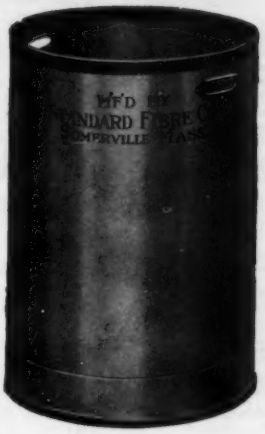
Card Clothing.
Howard Bros. Mfg. Co.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Feeds.
Schofield, Wm. Co.
Smith & Furbush Mach. Co
Whitin Machine Co.

Card Grinding Machinery.
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.
Whitin Machine Works.

WRITE US
for catalog on
other
Mill Receptacles.

No-Waste
SEAMLESS ROVING CANS
Glass Hard and Smooth as Silk



Waste Baskets
Taper Baskets
Oval Cans
Elliptical Cans

Sizes
9"-10"-11-12"-14"-18"
diameters
and
up to 45" high

NO
seams, joints
or
Rivets.

Styles

Polished
Steel
or
Rolled Fibre
Top Rims
Rings
BEADED
securely
to
Hard Fibre
Shells

Hard Fibre
MILL BARRELS
Plain Fibre
and
NEW PATTERN
Steel Clad
Trucks and Boxes
Combination
Doffing Cars

STANDARD FIBRE CO.
Somerville, Massachusetts

THE MARTINIQUE

(Affiliated with Hotel McAlpin)
Broadway, 32nd and 33rd Streets
NEW YORK CITY

SITUATED IN CENTRE OF SHOPPING DISTRICT—Adjacent to Theatre Section

Entrance from Hotel to New York Subway and Hudson Tubes affording direct communication with the Pennsylvania and Grand Central Stations, also general Post Office and Railroad Stations at Jersey City.

The Restaurants offer a truly McAlpin Service—with Club Breakfasts, Special Luncheons and Dinners, also a la Carte Service—All at moderate prices.

600 ROOMS

PLEASANT ROOMS FROM $2.50 UP.
FRANK E. JAGO—Resident Manager

HOTEL TULLER
DETROIT, MICH.

600 Rooms 600 Baths

$2.50 up, Single $4.50 up, Double

Agents Sample Rooms $5.00 per day

HEADQUARTERS IN DETROIT FOR

Old Colony Club
Detroit Automobile Club
Motion Picture Exhibitors' Assn.
Detroit Transportation Club

Table d'Hote Dinner $1.50 and $1.75
Business Men's Lunch .75.
Cafe A La Carte Cafeteria Men's Grille

BUYERS' INDEX—Continued.

Carpet Machinery.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Wks.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Carrier Aprons.
(See Aprons).

Carrier System.
Dowman, George.
Richards-Wilcox Mfg. Co.

Cases—Wooden.
(See Boxes).

Casement Window Hardware.
Richards-Wilcox Mfg. Co.
Seawell, Luke.

Castings.
Cresson-Morris Co.
Lombard Foundry & Mch. Co.
Walsh & Weidner Boiler Co.

Caustic Soda.
(See Bleaching Materials).

Cement Reinforcement.
Birmingham Slag Co.

Cement and Brick Coating.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Patterson-Sargent Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth Howland & Co., Inc.

Central Station (Electric).
Georgia Railway & Power Co.

Centrifugals.
Cresson-Morris Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

Chain Drives.
(See Belting—Chain Link).

Chain—Block, Bicycle, Auto, Engine, Agricultural, Etc.)
Morse Chain Co.

Chairs and Stools.
Lyon Metallic Mfg. Co.
Manufacturing Equipment & Engineering Co.
Monarch Theatre Supply ICo.

Chemicals.
(See Dyestuffs and Chemicals).

Chlorine Gas.
Electro Bleaching Gas Co.

Cleaning Machine—Blower.
Clements Mfg. Co.

Clocks—Hank, Etc.
(See Counters).

Clocks—Time.
Service Recorder Co.

Clocks—Watchman.
Chicago Watchman Clock Co.

Closets—Water.
(See Toilets).

Cloth Cutters.
Firsching, J. A.
Wildman Mfg. Co.

Cloth Guider (Electric).
Blake Electric Mfg. Co.

Cloth Reels.
Galladet Aircraft Corp.

Cloth Room Machinery.
Butterworth, H. W., & Sons Co.
Firsching, J. A.
Saco-Lowell Shops.
Scott & Co., Henry L.
Textile Finishing Machinery Co.
Wildman Mfg. Co.

Cloth Shrinking Machinery.
Reliance Machine Works.
Tolhurst Mch. Wks.

Cloth Testers.
Scott & Co., Henry L.

Cloth Winders.
(See Winders).

Clutches—Friction.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Link-Belt Company.
Wood's Sons Co., T. B.

Clutch Linings.
Diamond State Fibre Co.

Coal.
Truitt Coal & Iron Co.
U. S. Fuel Corp.

Coal & Ash Handling Machinery.
Link-Belt Company.

Coal Tar Disinfectants.
(See Disinfectants).

Cocks.
(See Valves).

Color Pails.
(See Buckets—Mill).

Comb Aprons.
(See Aprons).

Commission Merchants & Dealers.
(See Cotton Cloth Commission Merchants).

Compressors—Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Walraven Co., The.

Concrete Reinforcement.
Birmingham Slag Co.

Condensers.
Allis-Chalmers Mfg. Co.

Conduits.
Diamond State Fibre Co.

Conduits.
Crouse-Hinds Co.

Connectors—Frankel Solderless.
Westinghouse Elec. & Mfg. Co.

Consulting Engineers.
(See Architects and Engineers).

Contractors and Engineers—Building.
Goode, R. L.
Gude & Co.
Hearne System.
Robbins & Sons, J. E.
Spiker & Lose.
Tufts Co., Arthur.

Contractors—Electrical.
(See Electrical Engineers.

Contractors—Painting.
American Roofing & Paint Co.
Marshall Co., H. Newton.

Contractors (Piping.)
Marshall Co., H. Newton.

Contractors (Roofing.)
American Roofing & Paint Co.
Marshall Co., H. Newton.

Controlling Instruments—Temperature.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.

Conveyors—Belt.
(See Belt Conveyors).

Conveying Machinery.
American Supply Co.
Collins, J. D.
Cresson-Morris Co.
Dowman, George.
Hulme, J. S.
Link-Belt Co
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Richards-Wilcox Mfg. Co.
Schofield, Wm. Co.
Walraven Co.

Conveyors—Portable.
Dowman, George

Coolers.
(See Humidifying Apparatus.)

Coolers—Water.
(See Water Coolers).

Cooling and Conditioning Machines.
Manufacturers Machine Co.

Cooling Towers.
(See Tanks and Towers).

Copper Stamps and Stencils.
(See Stamps, Stencils, Etc.)

Cordage Machinery.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Cotton Yarn and Cloth Commission Merchants and Dealers.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Lane & Co., J. H.
Weimar Bros.
Woodward Baldwin & Co.

Cotton Merchants and Brokers.
Beer, H. & B.

Cotton Mills.
Gray Mfg. Co.

Cotton Mill Machinery and Supplies.
Augusta Mill Supply Co.
Barber-Colman Co.
Blake Electric Mfg. Co.
Boston Machine Works Co.
Butterworth & Sons, H. W.
Cocker Mach. & Foundry Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Eclipse Textile Devices, Inc.
Firsching, J. A.
Fletcher Works.
Galladet Aircraft Corp.
Greist Mfg. Co.
Greenville Spool & Mfg. Co.
Howard Bros. Mfg. Co.
Howard & Bullough.
Hunt Automatic Stop Motion, Inc.
Manufacturers Machine Co.
Mossberg Pressed Steel Corp.
Phila. Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Slaughter Mchry. Co., G. G.
Smith & Furbush Mach. Co.
Southern Bending Co.
Stafford & Co.
Steel Heddle Mfg. Co.
Terrell Machine Co.
Textile Finishing Machinery Co.
Tolhurst Mch. Wks
Universal Winding Co.
Walraven Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Cotton Storage.
(See Storage).

Cotton Tape Loom.
Fletcher Works.
Schaum & Uhlinger.

Cotton Yarn Mills.
(See Yarn Manufacturers).

Counters—Revolution, Hank, Pick, Etc.
Boston Machine Works.
Slaughter, G. G.

Counters (Time).
Service Recorder Co.

Counters—Restaurant.
(See Restaurant Equipment.)

Coupling—Shaft.
Cresson-Morris Co.
Wood's Sons Co., T. B.

Covers—Rollers.
Diamond State Fibre Co.

Cranes.
(See Hoists).

Crayons.
Dixon Crucible Co., Jos.
Lowell Crayon Co.

Crushing Machinery.
Allis-Chalmers Mfg. Co.

Cutters—Cloth.
(See Cloth Cutters).

Cypress Lumber.
Southern Cypress Mfg. Asso.

Cutters—Thread.
(See Thread Cutters).

Dehumidifying.
Sturtevant Co., B. F.

Delivery Cases.
(See Boxes—Packing).

Desks (Factory).
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.

Dial Scales.
(See Scales).

Dies—Steel.
(See Stamps, Stencils, Etc.)

Directory (Textile Mill).
Davison's Textile Blue Book.

Discs—Fibre.
Diamond State Fibre Co.

Disinfectants.
Barrett Co., The
Sanitas Co.

Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

Docks and Warehouses.
American Dock & Pouch Terminals.

Doffing Boxes—Mill.
(See Boxes—Mill).

Doffing Cars.
(See Cars).

Door Closers and Checks.
Richards-Wilcox Mfg. Co.
Seawell, Luke.

Doors & Elevator Enclosures.
Dowman, George.

Door Hangers.
Dowman, George.
Richards-Wilcox Mfg. Co.

Doors—Steel.
Lupton's Sons Co., David

Draft Gauges.
(See Gauges—Draft).

Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Drills—Electric.
(See Electric Machinery).

Drinking Fountains.
(See Fountains—Drinking).

Drop Wires.
Greist Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.

Drying Apparatus.
American Blower Co.
Sturtevant Co., B. F.

Drying Forms—Hosiery.
Pearson, Jos. T.

Drying Machinery.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

Dust Collectors.
(See Blowers and Blowing Systems).

Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
American Yarn & Processing Co
Franklin Process Co.
King, Habersham.

Dyeing, Bleaching, Finishing and Printing Machinery.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Galladet Aircraft Corp.
Hulme, J. S.
Klauder-Weldon Dyeing Mch. Co.
Manufacturers Machine Co.
Permutit Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Salem Iron Wks.
Schaum & Uhlinger.
Textile Finishing Machinery Co. The.
Tolhurst Machine Works.

Dyeing Machines (Package and Spool.)
Franklin Process Co.

Dye Sticks.
Phila. Drying Machinery Co.

Dyestuffs and Chemicals.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Du Pont de Nemours & So., E. I.
Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
Mathieson Alkali Works, Inc.
National Anfline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Sonneborn Sons Co., Inc., L.
Southern Distributing Co.
Staley Mfg. Co., A. E.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.
Zavon Co., Inc.

Elastic Stockings.
Estes Surgical Supply Co.
Perryman-Burson Co.

Electric Cleaning System—Suction.
Sturtevant Co., B. F.

Electric Conduit & Fittings.
General Electric Co.

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

Stronger Than Carbolic Acid

Six times—ten times—twenty times as strong!

SANITAS

Coal Tar Disinfectants

have the **power** to kill germs, and you get a signed guarantee of that power.

Order a trial shipment of SANITAS SIXCO that's our product that's six times as strong as Carbolic Acid—today. And when it comes, mix four tablespoonfuls of it in a pail of water, and let the milky white solution do its effective work. Let the permeating essence of this powerful disinfectant reach every nook and corner of your mill—wherever germs may breed.

Germs will be killed instantly. And the entire atmosphere of your mill will be refreshed.

SEND FOR FREE BOOKLET.

Our valuable manual on disinfection explains how to buy and use disinfectants scientifically. Send for your copy. It's free.

THE SANITAS COMPANY Inc.
33 KEAP STREET BROOKLYN, N.Y.

UCPC

UNITED CHEMICAL PRODUCTS CORPORATION

York and Colgate Sts., Jersey City, N. J.

Our New Products:

DIRECT SKY BLUE T CONC.
DIRECT BLACK E. U. CONC.
DIRECT BLUE 2 B CONC.
DIRECT BLUE 3 B CONC.
DIRECT BROWN G. C. CONC.
ALL SHADES OF NAVY BLUE & CORDOVAN

Southern Office, Realty Bldg., Charlotte, N. C.

REPRESENTATIVES:
R. T. GRANT, Charlotte, N. C.
GEO. W. WATSON, Hazelhurst, Miss.
B. R. DABBS, Atlanta, Ga.

BUYERS' INDEX—Continued.

Electric Dynamos and Motors.
See Motors and Generators).

Electric Fans.
(See Fans—Electric).

Electric Lamps.
(See Lamps).

Electric Lamp Guards.
Flexible Steel Lacing Co.

Electrical Engineers and Contractors.
Huntington & Guerry, Inc.

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Blake Electric Mfg. Co.
Carter Electric Co.
Cooper-Hewitt Elec. Co.
Cutter Works, George.
General Electric Co.
Hulme, J. S.
Slaughter Mchry. Co., G. G.
Walraven Co., The.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

Electric Tractors and Trucks.
(See Tractors & Trucks—Elec).

Elevators—Portable.
Collins, J. D.
Lovingood Co.

Elevators.
Link-Belt Company.

Emergency Supplies for First Aid Rooms.
Estes Surgical Supply Co.
Perryman-Burson Co.

Enamel—Mill White.
(See Paint).

Engineers—Mill.
(See Architects).

Engines—Oil, Gas and Gasoline.
Allis-Chalmers Mfg. Co.
Walraven Co., The.

Engines—Steam.
Allis-Chalmers Mfg. Co.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Sturtevant Co., B. F.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Engine Room Appliances and Supplies.
Crane Co.
Cutter Works, George.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.
Slaughter Mchry. Co., G. G.
Sturtevant Co., B. F.
Walraven Co.
Westinghouse Electric & Mfg. Co.

Exporters—Cotton.
(See Brokers).

Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
General Elec. Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems).

Fasteners—Belt.
(See Belt Fasteners).

Feed Water Purifiers.
(See Boiler Feed Water Purification).

Felting Machinery.
Smith & Furbush Mch. Co.

Fence—Steel and Iron.
Cyclone Fence Co.

Fibre Products.
Diamond State Fibre Co.
Standard Fibre Co.

Fillets (Calender and Doffer, Strippers, Burnishing and Emery.)
Howard Bros. Mfg. Co.

Filters—Water.
American Water Softener Co.
Hulme, J. S.
Norwood Engineering Co.
Permutit Co.
Scaife & Sons Co., Wm. B.

Filters—Oil Removal.
Norwood Engineering Co.
Permutit Co.
Sherwood Mfg. Co.

Filters—Sand.
Permutit Co.

Films (Moving Picture).
Monarch Theatre Supply Co.

Finishing.
(See Dyers, Bleachers and Finishers).

Finishing, Bleaching and Sizing Materials.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Corn Products Refining Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works.
Rock Glen Salt Co.
Roessler & Hasslacher Co.
Sonneborn Sons, Inc., L.
Southern Distributing Co.
Staley Mfg. Co., A. E.
Stearns, Wm. Taylor.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.
Zavon Co., Inc.

Fire Doors and Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.
Seawell, Luke.
Sanymetal Products Co.
Vonnegut Hardware Co.

Fire Hose.
(See Hose—Fire).

Fire Protecting Paint.
(See Paint).

First Aid Room Equipment and Supplies.
Estes Surgical Supply Co.
Perryman-Burson Co.

Flexible Couplings.
Cresson-Morris Co.

Flood Lights—Electric.
General Electric Co.

Flooring—Hardwood.
Hightower Box & Tank Co.
Southern Cypress Mfg. Co.

Floor Scrubbing Machine.
American Scrubbing Equip. Co.

Floor Scrubbing Powders.
India Alkali Works.

Floor Sweeps.
See Brushes.

Fluted Rolls.
Campbell Mfg. Co.
Howard & Bullough.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Founders.
Cresson-Morris Co.
Lombard Fdry. & Mch. Works.

Fountains—Drinking.
Crane Co.
Manufacturing Equipment & Engineering Co.
Pure Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.
Twentieth Century Brass Works.

Friction Clutches.
(See Clutches—Friction).

Fuel.
(See Coal).

Fuel Economizers.
Sturtevant Co., B. F.

Fuses.
(See Elec. Mchy. and Supplies).

Garage Doors and Door Hardware.
Richards-Wilcox Mfg. Co.
Seawell, Luke.

Garnett Machines.
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas).

Gaskets.
Diamond State Fibre Co.

Gauge Cocks.
Lunkenheimer Co.

Gauges—Draft.
Taylor Instrument Co.

Gauges—Mercury Column Vacuum.
Taylor Instrument Co.

Gauge—Oil.
Lunkenheimer Co.

Gauges—Pressure.
Taylor Instrument Co.

Gauges—Recording.
Taylor Instrument Co.

Gauges—Water.
Lunkenheimer Co.

Gears—Silent.
Diamond State Fibre Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

Gear Transmission.
Sturtevant Co., B. F.

Gear Cutting and Cutters.
Cresson-Morris Co.
Whitin Machine Co., D. E.

Gear Pullers.
General Electric Co.

Generators—Electric.
(See Motors and Generators).

Glassware and Dishes.
(See Dishes).

Governors—Pump.
General Electric Co.

Graphite Products.
Dixon Crucible Co., Jos.

Grates—Boiler.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

Grates—Mechanical.
(See Stokers).

Grease.
(See Lubricants).

Grease Cups.
(See Lubricators).

Green Houses.
Hulme, J. S.

Grindstones.
Richards-Wilcox Mfg. Co.

Grinders—Card, Cylinder, Roll, Napper and Garnet.
(See Card Grinding Machinery).

Guards—Electric Lamp.
Flexible Steel Lacing Co.

Guides—Thread.
Palmer Co., I. E.

Guider (Cloth-Electric.)
Blake Electric Mfg. Co.

Gums.
(See Finishing and Sizing Materials).

Gymnasium Apparatus.
Medart Mfg. Co., Fred.

Hangers.
(See Shafting and Hangers).

Hardware (Building.)
Richards-Wilcox Mfg. Co.
Seawell, Luke.
Sanymetal Products Co.
Vonnegut Hardware Co.

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Southern Bending Co.

Heads—Bobbin and Spool.
Diamond State Fibre Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus).

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Howard Bros. Mfg. Co.
Steel Heddle Mfg. Co.

Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.

Hoists.
Curtis Pneumatic Mchry. Co.
Hulme, J. S.
Link-Belt Company.
Morse Chain Co.
Walraven Co.

Hose—Fire.
Collins, J. D.

Hosiery Dyeing Machinery.
Cocker Mach. & Fdry. Co.
Franklin Process Co.

Hosiery Forms.
(See Drying Forms).

Hosiery Yarns.
(See Yarn Manufacturers).

Hospital Equipment and Supplies.
Estes Surgical Supply Co.
Perryman-Burson Co.

Hotels.
Hotel Tuller.
Hotel Martinique.

Houses—Ready-Made.
Seawell, Luke.

Humidifying Apparatus.
American Blower Co.
American Moistening Co.
Carrier Eng. Corp.
Manufacturers Machine Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Humidity Indicating Instruments.
Powers Regulator Co.
Taylor Instrument Co.

Hydraulic Turbines.
(See Turbines—Hydraulic).

Hydro Extractors.
(See Extractors).

Hydrometers.
Taylor Instrument Co.

Hygrometers.
Taylor Instrument Co.

Hygrodeiks.
Taylor Instrument Co.

Indicating and Recording Instruments and Thermometers.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.

Indigo.
(See Dyestuffs and Chemicals).

Industrial Relationship Service.
Sherman Service, Inc.

Industrial Sites.
Nashville Industrial Corp.

Injectors.
Lunkenheimer Co.

Insulation—Vulcanized Fibre.
Diamond State Fibre Co.

Ink—Stencil and Marking.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

Iron Work—Ornamental.
Cyclone Fence Co.
Dufur & Co.
Lombard Iron Works & Supply Co.

Jack Spools.
(See Spools).

Jacquards.
Crompton & Knowles Loom Wks.

Jerker Straps.
Augusta Mill Supply Co.

Jute Bagging Machine.
Smith & Furbush Machine Co.

Kettles—Size.
(See Size Kettles).

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleacher Kiers).

Knit Goods Specialties.
Knit Goods Specialty Co.

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers).

Knit Goods Washers.
(See Washers—Cloth).

Knitting Machinery and Supplies.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Marken Machine Co.
Scott & Williams.
Wildman Mfg. Co.

Laboratory Instruments and Thermometers.
Estes Surgical Supply Co.
Perryman-Burson Co.
Taylor Instrument Co.

Lacing—Belt.
(See Belt Lacing).

Emmons Loom Harness Company

LAWRENCE, MASS.

THE LARGEST MANUFACTURERS OF LOOM HARNESS AND REEDS IN AMERICA

Loom Harness and Reeds

COTTON HARNESS for all kinds of Plain and Fancy Weaves in Cotton and Silk Goods.
MAIL HARNESS for Cotton Duck, including Tire Duck, Worsted and Silk Goods.
SELVEDGE HARNESS, any depth up to 24 inches, for Weaving Tape Selvedges.
REEDS for Cotton, Woolen, Silk and Duck.
Slasher and Striking Combs, Warper and Leice Reeds, Beamer and Dresser Hecks, Mending Eyes, Jacquard Heddles.
We make a specialty of equipping Harnesses for the Drawing-In Machines.

B C
TRADE MARK

BARBER-COLMAN COMPANY

Main Office and Factory

Rockford, Ill.

Boston, Mass. **Greenville, S. C.**

WARP TYING MACHINES

WARP DRAWING MACHINES

HAND KNOTTERS FOR SPOOLING AND WINDING

Shafts, Pulleys, Hangers, Belting Packing, Lacing

BOILERS

For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store

AUGUSTA, GEORGIA

COTTON—WOOL—SILK
DYED or BLEACHED in SKEIN
Fast to Bleaching. Delivered in Skein or Tube.
PROMPT DELIVERIES—RIGHT PRICE
Backed by 18 Years Experience.
Same yardage delivered as received. COUNT YOUR SKEINS.
Your Patronage Solicited.
HABERSHAM KING, JR.
Plant: 4-6 North Butler St., Atlanta, Ga.

STENCILS FOR COTTON SHIPPERS, COTTON MILLS MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK MARKING POTS
RUBBER STAMPS, NOTARIAL & CORPORATION SEALS
ATLANTA RUBBER STAMP & STENCIL WORKS
OFFICE 28 LUCKIE ST. WORKS 356 EDGEWOOD AVE.
OLDEST STENCIL AND STAMP HOUSE IN GEORGIA ATLANTA GA

Tycos
TEMPERATURE INSTRUMENTS
Indicating - Recording - Controlling
The Tycos organization has built such dependability, accuracy and long life into Tycos instruments that industrial leaders everywhere regard them as the logical temperature instruments to install.
Ask for descriptive catalog and consultation with Tycos engineers—aids that obligate you in no way if you give firm connection.
Taylor Instrument Companies
Rochester, N. Y.
There's a Tycos and Taylor Temperature Instrument for Every Purpose

V.F.

BUYERS' INDEX—Continued.

Lamps—Incandescent and Arc.
Carter Electric Co.
Cooper Hewitt Electric Co.
Cutter Works, George.
General Electric Co.
Seaweil, Luke
Walraven Co.
Westinghouse Elec. & Mfg. Co.
Westinghouse Lamp Co.

Lamp Guards—Key Locking.
Flexible Steel Lacing Co.

Lamp Reflectors.
Carter Electric Co.
Cooper Hewitt Electric Co.
Cutter Works, George.
Westinghouse Elec. & Mfg. Co.

Landscape Architects.
(See Village Architects).

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Latches (Fire Exit Self-Releasing.)
Vonnegut Hardware Co.

Laundry Machinery.
American Laundry Mach'y Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Lavatories.
Crane Co.
Manufacturing Equipment & Engineering Co.
Vogel Co., Jos. A.

Leather Belting.
(See Belting).

Leather Specialties.
American Supply Co.
Williams & Sons, I. B.

Lights—Flood.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Linen Yarns.
(See Yarns—Linen).

Link Belting.
(See Belting—Link).

Linters.
(See Waste Dealers).

Liquid Chlorine.
(See Chlorine).

Loaders—Wagon and Truck.
Link-Belt Company.

Locks and Latches.
Richards-Wilcox Mfg. Co.

Lockers—Metal.
Collins, J. D.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

Logwood Extract.
(See Dyestuffs and Chemicals).

Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

Loom Attachments—Automatic.
Draper Corporation.

Loom Harness.
(See Harness).

Lubricants.
Dixon Crucible Co., Jos.
N. Y. & N. J. Lubricant Co.
Swan & Finch Co.
Texas Co.

Lubricators.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

Lug Straps.
(See Straps—Lug).

Lumber.
Southern Cypress Mfg. Asso.

Lunch Room Equipment.
(See Restaurant).

Machine Tools.
(See Tools).

Machinists.
Cresson-Morris Co.

Marking Machines.
Marken Machine Co.

Marking Pots, Stencils, Inks, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

Mercerized Yarns.
(See Yarn Manufacturers).

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Metal Ceilings, Etc.
Dowman, Geo. A.
Lupton's Sons Co., David.

Metals—Perforated.
(See Screens and Sieves).

Metal Workers—Sheet.
Lombard Iron Works & Supply Co.

Meters—Flow, Air, Gas, Electric Steam, Etc.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co.
Taylor Instrument Co.
Westinghouse Elec. & Mfg. Co.

Meters—Revolution.
Taylor Instrument Co.

Mill Baskets and Boxes.
(See Boxes—Mill).

Mill Engineer.
(See Architects and Engineers).

Mill Villages.
(See Villages).

Mill Supplies—Miscellaneous.
(See Supplies—Mill).

Mill White Paint.
(See Paint).

Monorail Conveying Systems.
Richards-Wilcox Mfg. Co.

Mops.
Atlanta Brush Co.
Harris Broom Co.
Southern Brush & Broom Co.
Southwestern Broom Mfg. Co

Motors and Generators—Electric.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co.
Hulme, J. S.
Nashville Industrial Corp.
Sturtevant Co., B. F.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.

Moving Picture Mch. & Supplies.
(See Theatre Equipment).

Nappers.
Roy & Son Co., B. S.

Napper Clothing.
Howard Bros. Mfg. Co.

Office Partitions.
Sanymetal Products Co.

Oils.
Johnson & Co., Inc., Oliver.
Wadsworth, Howland & Co., Inc.

Oils—Finishing.
(See Finishing and Sizing Materials).

Oils—Lubricating.
(See Lubricants).

Oil Cups.
(See Lubricators).

Oil Paper.
Bradley Mfg. Co., A. J.

Oiling Devices.
(See Lubricators).

Openers for Cotton, Wool, Waste, Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Overhead Carriers.
Dowman, George.

Oxidizing Machinery.
Cocker Mch. & Fdry. Co
Salem Iron Works.
Phila. Drying Machinery Co.

Oxygen.
Commercial Acetylene Supply Co.
Standard Gas Products Co.

Packing Boxes & Cases—Wooden.
Hightower Box & Tank Co.
National Asso. of Box Mfgrs.
Walke Box Co., Inc.

Packings.
Augusta Mill Supply Co.
Walraven Co.

Paint.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co., The.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Southern Distributing Co.
Tropical Paint & Oil Co.
Wadsworth, Howland & Co., Inc.

Painting Contractors.
(See Contractors.)

Panel Boards.
(See Switchboards).

Paper.
Bradley Mfg. Co., A. J.
Diamond State Fibre Co.

Partitions (Office and Toilet).
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

Perforated Metal.
(See Screens and Sieves).

Partitions—Steel.
Dowman, Geo.
Lupton's Sons Co., David

Peroxides.
Roessler & Hasslacher Chemical Co.

Pickers—Curled Hair.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Pickers—Leather.
Augusta Mill Supply Co.
Garland Mfg. Co.

Picker Sticks.
Augusta Mill Supply Co.
Garland Mfg. Co.
Southern Bending Co.
Shambow Shuttle Co.
Walraven Co.

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pinions.
Diamond State Fibre Co.
General Electric Co.

Pipe and Pipe Fittings.
Crane Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walraven Co.

Pipe Threading and Cutting Machines.
Walraven Co., The.

Playground Apparatus Equipment.
Crane Co.
Hill-Standard Co.
Manufacturing Equipment & Engineering Co.
Puro Sanitary Drinking Fountain Co.
Taylor, Halsey W.
Twentieth Century Brass Works.

Pneumatic Collecting & Conveying Systems.
Sturtevant Co., B. F.

Pneumatic Machinery & Tools.
Curtis Pneumatic Mchry. Co.

Portable Conveyors.
(See Conveyor.)

Power (Electric.)
Georgia Railway & Power Co.

Power Transmission.
Aldrich Mach. Works.
Allis-Chalmers Mfg. Co.
Augusta Mill Supply Co.
Carlyle-Johnson Mch. Co.
Columbus Novelty Mfg. Co.
Cresson-Morris Co.
Fafnir Bearing Co.
Flexible Steel Lacing Co.
General Electric Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Manufacturing Equipment & Engineering Co.
Morse Chain Co.
Russell Mfg. Co.
S K F Industries.
Slaughter Mchry. Co., G. G.
Transmission Ball Bearing Co
U. S. Ball Bearing Co.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co
Williams & Sons, I. B.
Wood's Sons Co., T. B.

Pressed Steel.
Lupton's Sons Co., David.

Presses.
American Laundry Mchry. Co
Butterworth & Sons Co., H. W.
Economy Baler Co.
Famous Mfg. Co.
Galland-Henning Mfg. Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Pulleys.
Augusta Mill Supply Co.
Cresson-Morris Co.
Diamond State Fibre Co.
Link-Belt Company.
Walraven Co., The.
Wood's Sons Co., T. B.

Pulley Covering.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Sydnor Pump & Well C., Inc
Toomey, Frank.
Walraven Co.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

Pump Valves.
(See Valve Discs).

Psychrometers—Sling.
Taylor Instrument Co.

Pyrometers.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Machine Co.
Dufur & Co.

Railroads.
Southern Railway.

Receptacles—Fibre.
(See Fibre Products).

Recording Instruments.
Boston Machine Works.
General Electric Co.
Powers Regulator Co.
Service Recorder Co.
Taylor Instrument Co.

Recorders (Machine Service Time).
Service Recorder Co.

Recorders—Temperature.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.
Southern Bending Co.
Shambow Shuttle Co.
Walraven Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Galladet Aircraft Corp'n.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works

Reflectors—Lamp.
(See Lamp Reflectors).

Regulators—Liquid Level.
General Electric Co.

Regulators—Pressure.
General Electric Co.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers).

Reinforcing Slag.
Birmingham Slag Co.

Repairing—Electrical.
Westinghouse Elec. & Mfg. Co.

Repairing—Textile Machinery, Etc.
Autogenous Welding Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

Restaurant Equipment.
Sanymetal Products Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

ESSCO

ESTES SURGICAL SUPPLY CO.

16 N. FORSYTH ST., ATLANTA, GA.

Be prepared for an accident, let us equip you for a first aid room. Textile First Aid Cabinets.

Physicians', Surgeons' and Hospital Supplies, Elastic Stockings, Trusses, Crutches and Abdominal Belts.

WHOLESALE DRUGS.

Write, wire or phone us.

Long Distance Phones, Ivy 1700 and Ivy 1701.

We are in position to send an expert to furnish estimate on equipments.

STAG STEEL BELT LACING

Only full line of ZIG-ZAG Steel Lacing made

ONLY 8 SIZES

The ZIG-ZAG Principle is the Life of the Joint

STRONG SMOOTH ELASTIC QUICK DURABLE CHEAP

GUARANTEED in ALL KINDS and SIZES of BELTS and over ALL SIZE PULLEYS

MANUFACTURED BY COLUMBIA NOVELTY MFG. CO. ST. LOUIS, U.S.A.

A BETTER LACING FOR LESS MONEY

Reduce Your Fuel Costs 20 Per Cent

Drain your steam heated equipment and return the condensation to your boilers with the Morehead Back-to-Boiler System.

Department C

MOREHEAD MANUFACTURING CO., Detroit, Mich.

(28)

Morehead

"BACK-TO-BOILER-SYSTEM"

FAFNIR

Ball Bearings

all standard types & sizes

FAFNIR Double Ball Bearing Hanger Boxes.

THE FAFNIR BEARING COMPANY

Conrad Patent Licensee

New Britain, Conn.

CHICAGO NEW YORK, DETROIT CLEVELAND

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY

Iron Founders, Textile Machinery Builders.

Krams Ave., Manayunk, Philadelphia, Pa.

COAL

HIGH GRADE

KENTUCKY, TENNESSEE AND ALABAMA

STEAM, GAS,

DOMESTIC, SMITHING

FURNACE AND FOUNDRY COKE

UNITED STATES FUEL CORPORATION

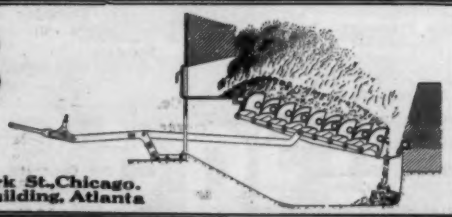
CHATTANOOGA, TENN.

COKAL HAND STOKERS

Hundreds of satisfied users report saving of fuel and increased boiler capacity.

Write for Catalog.

COKAL STOKER CORPORATION, 1017 N. Clark St., Chicago. 517 Hurt Building, Atlanta



FAMOUS MANUFACTURING CO.

MANUFACTURERS OF "FAMOUS" AND "CHAMPION" BALING PRESSES FOR ALL PURPOSES

COTTON
COTTON WASTE
COTTON SEED HULLS
RAGS, PAPER, ETC.

SCRAP METALS
WOOD SHAVINGS
SAW DUST
EXCELSIOR
CURLED HAIR ETC

SOUTHERN AGENTS LOVINGOOD CO. ATLANTA, GA.

140 MAIN STREET EAST CHICAGO, IND.

BUYERS' INDEX—Continued.

Ring Travelers—Steel and Bronze.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

Rings—Spinning.
(See Spinning Rings).

Rocker Shaft Bearings.
(See Bearings).

Rolls—Calender.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Roy & Son Co., B. S.
Textile Finishing Machinery Co.

Rolls—Rubber Covered.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Textile Finishing Machinery Co.

Rolls—Steel.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Southern Spindle & Flyer Co.
Textile Finishing Machinery Co.

Rolls—Top.
Campbell Mfg. Co.

Roofing.
American Roofing & Paint Co.
Barrett Co., The.
Cortright Metal Roofing Co.
Dowman, George.
Peaslee-Gaulbert Co., Inc.
Wadsworth, Howland & Co.
Walraven Co.

Roof and Cement Coating.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Tropical Paint & Oil Co.
Wadsworth, Howland & Co.

Rope—Transmission.
Cresson-Morris Co.
Link-Belt Company.
Walraven Co.

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Goods.
Estes Surgical Supply Co.
Perryman-Burson Co.

Rubber Stamps.
(See Stamps, Stencils, Etc)

Salt.
Rock Glen Salt Co.

Sanitary Products.
Crane Co.
Estes Surgical Supply Co.
Manufacturing Equipment & Engineering Co.
Perryman-Burson Co.
Pure Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Sanitas Co.
Taylor, Halsey W.
Vogel Co., Jos. A.

Sash-Window—Steel.
Dowman, Geo.
Lupton's Sons Co., David.
Seawell, Luke.

Scale Preventer—Boiler.
(See Boiler Feed Water Purification).

Screens (Moving Picture).
Monarch Theatre Supply Co.

Screens and Sieves—Perforated.
Erdle Perforating Co.
Link-Belt Company.

Scouring Machinery.
(See Washers (Cloth)

Scrubbing Machine—Floor.
American Scrubbing Mch. Co.

Scrubbing and Washing Powders.
India Alkali Works.
Mathieson Alkali Works.
Warren Soap Mfg. Co.

Second Hand Machinery and Supplies.
Nashville Industrial Corp.
Toomey, Frank, Inc.
Walraven Co.

Sewing Machines.
Merrow Machine Co., The.
Textile Finishing Machinery Co.

Shades—Electric Lamp.
(See Reflectors).

Shafting and Hangers.
Augusta Mill Supply Co.
Cresson-Morris Co.
Fafnir Bearing Co.
Link-Belt Co.
S K F Industries.
Walraven Co., The.
Wood's Sons Co., T. B.

Shears.
Roy & Sons Co., B. S.

Shelving—Sectional Steel.
Collins, J. D.
Dowman, George
Hyatt Roller Bearing Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.
Seawell, Luke.
Vonnegut Hardware Co.

Shingles—Asphalt.
Barrett Co.

Shingles—Metal.
Cortright Metal Roofing Co.
Dowman, George

Shingles—Wood.
Southern Cypress Mfg. Asso.

Shipping Room Machinery and Supplies.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Collins, J. D.
Diamond State Fibre Co.
Handy Equip. Corp.
Hightower Box & Tank Co.
Hulme, J. S.
Lane & Bro., W. T.
Standard Fibre Co.
Signode System, Inc.
Walraven Co., The.
Walke Box Co., Inc.

Shower Baths and Cabinets.
Crane Co.
Sanymetal Product sCo.

Shuttles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Shambow Shuttle Co.
Southern Bending Co.
Walraven Co.

Sick Room Supplies.
Estes Surgical Supply Co.
Perryman-Burson Co.

Singeing Machinery.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

Sites for Factories. (See Industrial Sites.

Size Box Temperature Controller.
Powers Regulator Co.
Taylor Instrument Co.

Size Kettles.
Butterworth & Sons Co., H. W.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

Sizing and Finishing Compounds.
(See Finishing and Sizing Materials).

Skewers.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.

Skylights—Rolled Steel.
Dowman, George.
Lupton's Sons Co., David.
Seawell, Luke

Slag for Concrete.
Birmingham Slag Co.

Slashers and Slasher Room Supplies.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
PickensSlasher Hood Co., R. O.
Saco-Lowell Shops.
Salem Iron Wks.
Textile Finishing Machinery Co., The.

Slasher Tape.
(See Tape—Slasher).

Slate Asphalt Roofing.
Barrett Co.

Sliding Partition Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.
Sanymetal Product sCo.
Seawell, Luke.
Vonnegut Hardware Co.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Soap—Textile.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
India Alkali Co.
Kali Mfg. Co.
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Newport Chemical Works.
Sonneborn Sons, Inc., L.
Stearns, Wm. Taylor.
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques.

Soda (Textile, Soda Ash and Boiling.)
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Sonneborn Sons, Inc., L.

Softeners—Cotton.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Ford Co., J. B.
Grasselli Chemical Co.
Kali Mfg. Co.
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Newport Chemical Works
Roessler & Hasslacher Chemical Co.
Sonneborn Sons, Inc., L.
United Chemical Products Corp.
Wolf & Co., Jacques.
Zavon Co., Inc.

Softeners—Water.
(See Water Softeners).

Solderless Connectors—Frankel.
Westinghouse Elec. & Mfg. Co

Solvents.
(See Finishing).

Spindles.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co
Whitin Machine Works.

Spinners.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Fletcher Works.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Commn. Co
Myrtle Mills, Inc.
Parkdale Mills, Inc.

Spinning Frames.
American Machine Co., H. & B.
Crompton & Knowles Loom Wks.
Howard & Bullough.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

Spinning Rings.
Draper Corporation.
Howard & Bullough.
Greenville Spool & Mfg. Co.
Greist Mfg. Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Spinning Tape Specialists.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Campbell Mfg. Co.
Knit Goods Specialty Co.

Spooling Machinery.
Draper Corporation.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Spools and Skewers.
Greenville Spool & Mfg. Co
Mossberg Pressed Steel Corp'n.
Shambow Shuttle Co.
Walraven Co.

Sprinkler Tanks.
(See Tanks, Towers, Etc.).

Sprockets.
Link-Belt Company.
Morse Chain Co.

Spur Cap Shells.
Galladet Aircraft Corp.

Stamps, Stencils and Stencil Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.

Stand Pipes.
(See Tanks, Towers, Etc.).

Starch and Gums.
(See Finishing and Sizing Materials).

Steam Engines.
(See Engines—Steam).

Steam Hose.
(See Hose—Fire.)

Steam Pumps.
(See Pumps—Steam).

Steam Traps.
(See Traps—Steam).

Steel Shelving, Doors, Window Partition, Etc.)
Dowman, George.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.
Seawell, Luke.

Steel Lockers.
Lyon Metallic Mfg. Co.
Seawell, Luke.

Stencils and Stencil Papers.
(See Stamps and Stencils).

Stencil Brushes.
(See Marking Pots and Brushes).

Stencil Cutting Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.

Sticks (Picker).
See Picker Sticks.

Stop Motion.
Crompton & Knowles Loom Wks.
Draper Corporation.
Eclipse Textile Devices, Inc.
Hunt Automatic Stop Motion, Inc.
Whitin Mch. Wks.
Wildman Mfg. Co.

Stokers.
Cokal Stoker Co.
Detroit Stoker Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg Co.

Storage Warehouse.
American Dock & Pouch Terminals.

Storage Racks.
(See Shelving).

Straps—Lug.
Augusta Mill Supply Co.
Garland Mfg. Co.

Strapping.
(See Leather Specialties or Band Strapping).

Street Lighting Fixtures.
Cutter Works, George.

Supplies—General Mill.
Augusta Mill Supply Co.
Hulme, J. S.
Howard Bros. Mfg. Co.
Lyon Metallic Mfg. Co.
Nashville Industrial Corp.
Regnas & Co., J. R.
Slaughter Machinery Co., G. G.
Southern Distributing Co.
Steel Heddle Mfg. Co.
Walraven Co., The.

Surgical Supplies.
Estes Surgical Supply Co.
Perryman-Burson Co.

Switches—Knife-Elec.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

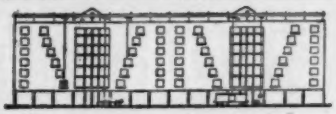
Switchboards—Panel.
Cutter Co., George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Tables, Chairs, Etc.
Hill-Standard Co.
Manufacturing Equipment & Engineering Co.

Tallow.
(See Finishing Materials).

Tanks and Tubs.
Hightower Box & Tank Co.
Lombard Iron Works & Supply Co.
Permutit Co.
National Asso. of Box Mfgrs.
Phila. Drying Machinery Co.
Salem Iron Wks.
Textile Finishing Machinery Co., The.
Walsh & Weidner Boiler Co.

COTTON STORAGE



Why not carry your surplus cotton in New York?
Service guaranteed by 40 years' experience—Security and Protection Combined—all employees bonded.
All warehouses protected by sprinklers.
2,500,000 cu. ft. additional storage area now building.
The only Dock and Warehouse Terminals in City of New York having direct all-rail connection with trunk lines independent of float or lighter system.
Storage in transit facilities.
The only cotton fumigating plant in New York City located on premises.
All stores licensed by New York Cotton Exchange.
Write for current rates.

American Dock & Pouch Terminals
17 State Street, New York

HOW PENNIES PROTECT YOUR DOLLARS

—is the title of a little booklet that every executive in the Textile Field should read. It will be mailed free upon request.

THE TROPICAL PAINT & OIL COMPANY
CLEVELAND, OHIO
"The Firm that Serves With What Preserves."

AUGUSTA MILL SUPPLY CO.

Textile Machinery
General Mill Supplies
Transmission and Power Apparatus

429 JACKSON ST. AUGUSTA, GA.

BALL BEARINGS
Chapman
YOU PAY FOR THEM WHETHER YOU BUY THEM OR NOT
MANUFACTURED BY
TRANSMISSION BALL BEARING CO.
1061 Military Road Buffalo, N. Y.

ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the sellers' profits.

The Name "Barber" Assures Your Satisfaction
It's hard to talk quality in spinning tape—it's a product that is almost a staple—many manufacturers believing there is no difference between one make and another and no amount of argument will change their opinion.
But regardless of the fact that "Barber" tapes contain just the proper weight and construction to insure long life and smooth, steady operation, there is a certain satisfaction in buying from Barber that is shown in the healthy growth of our business year after year. We believe it's due to the "knowing how" that we put into our product—a knowledge that is the experience of years dating back to the first tape drive put on a spinning frame. Then also, remember that we are spinning tape specialists and that "Barber" tapes set the standard.
"Barber" tapes are carried in an extensive stock for all kinds of textile machinery.
A wire to us at our expense will bring you service that all our customers like. Write us for prices.
Barber Mfg. Co.
Spinning Tape Specialists
LOWELL, MASS.
BARBER
SPINNING & TWISTING TAPES

BUYERS' INDEX—Continued.

Tapes and Braids.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Knit Goods Specialty Co.
Weimar Brothers.

Tape Looms—Cotton.
Fletcher Works.
Schaum & Uhlinger.

Tapes—Spinning and Twisting.
Barber Mfg. Co.
Knit Goods Specialty Co.

Tape Making Machines.
(See Bandage and Tape Mach.)

Telephones—Calling System.
Carter Electric Co.

Temperature Controllers.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Powers Regulator Co.
Sturtevant Co., B. F.
Taylor Instrument Co.

Temples.
Draper Corporation.

Tenters.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

Tenter Frame Guider (Electric).
Blake Electric Mfg. Co.

Textile Machinery.
(See Cotton Mill Machinery).

Theatre Equipment.
Monarch Theatre Supply Co.

Thermometers—All Kinds.
Taylor Instrument Co.

Thin Place Preventers.
Draper Corporation.

Thread Guides.
Palmer Co., The I. E

Time Clocks.
(See Clocks.)

Tiering Machines.
Collins, J. D.

Ties—Baling.
(See Bale Ties).

Toilets.
Crane Co.
Manufacturing Equipment & Engineering Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Toilet Partitions.
Lupton's Sons Co., David.
Sanymetal Products Co.

Tool Cabinets—Steel.
Lupton's Sons Co., David
Lyon Metallic Mfg. Co.

Tool Stands—Steel.
Lupton's Sons Co., David
Lyon Metallic Mfg. Co.

Tools—All Kinds.
Walraven Co., The.

Top Flats Reclothed.
Howard Bros. Mfg. Co.

Towers.
(See Tanks and Towers).

Tractors—Electric, Industrial.
Collins, J. D.

Transmission—Power.
(See Power Transmission Machinery).

Traps—Return Steam.
American Blower Co.
Morehead Mfg. Co.
Sturtevant Co., B. F.

Trucks—Auto.
Packard Motor Car Co.
White Co.

Trucks, Baskets, Etc., Canvas.
Lane & Bro., W. T.

Trucks—Electric—Inter.
Collins, J. D.

Trucks—Hand and Elevating.
Collins, J. D.
Handy Equip. Corp.
Hulme, J. S.

Trucks—One Man.
Handy Equip. Corp.

Trucks—Fibre—Inter, Etc.
Diamond State Fibre Co
Standard Fibre Co

Trusses and Abdominal Belts.
Estes Surgical Supply Co.
Perryman-Burson Co.

Tubes—Cloth.
Diamond State Fibre Co.

Turbines (Hydraulic).
Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Turbines—Steam.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Twisting Machinery and Supplies.
Barber Mfg. Co.
Draper Corporation.
Howard & Bullough.
Knit Goods Specialty Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Urinals.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Unions—Bronze.
Crane Co.
Lunkenheimer Co.

Vacuum Cleaning System for Mills.
Sturtevant Co., B. F.

Vacuum Pans.
Cresson-Morris Co.

Valves—Angle, Globe, Cross, Blow-off, Check, Gate, Pop-Safety, etc.).
Crane Co.
Lunkenheimer Co.

Valves—Non-return Stop.
Crane Co.
Lunkenheimer Co.

Varnishes.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Tropical Paint & Oil Co.
Wadsworth, Howland & Co., Inc.

Ventilating Apparatus.
American Blower Co.
Carlisle & Gale Co.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Sargent's Sons Co., C. G.
Seawell, Luke.
Sturtevant Co., B. F.
Tolhurst Machine Co.

Vises and Benches.
Richards-Wilcox Mfg. Co.

Village Architects and Designers.
Lockwood, Green & Co.
Sirrine, J. E.
Spiker & Lose.

Village Houses.
(See Houses—Ready-Built).

Wagon and Car Unloaders.
Curtis Pneumatic Mchry. Co.

Warehouses and Terminals.
American Dock & Pouch Terminals.

Warehouse—Portable.
(See Buildings).

Warehouse Door Hardware.
(See Doors and Hardware).

Warp Drawing Machine.
Cocker Machine & Fdry. Co.
Crompton & Knowles Loom Wks.

Warpers and Warping Machinery.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.

Wash Basins.
(See Lavatories).

Washers—Cloth.
American Laundry Machinery Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

Washers.
Diamond State Fibre Co.

Washing Powders (Floor).
India Alkali Works.

Waste Bins—Steel.
Lupton's Sons Co., David.

Waste Machinery—Cotton.
Howard & Bullough.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Watchman Clocks.
(See Clocks—Watchman).

Water Coolers—Fountain).
Crane Co.
Manufacturing Equipment & Engineering Co.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.
Twentieth Century Brass Works.

Water Columns.
Lunkenheimer Co.

Water Softeners & Purifiers.
American Water Softener Co.
Hulme, J. S.
Norwood Engineering Co.
Permutit Co.
Scaife & Sons Co., Wm. B.

Water Supply System.
Sydnor Pump & Well Co., Inc

Water Towers.
(See Tanks and Towers).

Waterproofing Machinery.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

Weaving.
(See Yarn Manufacturers).

Welding Apparatus—Electric Arc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Welding Apparatus and Supplies—Oxy-Acetylene.
Commercial Acetylene Supply Co.
Standard Gas Products Co.

Welding—Job.
Autogenous Welding Co.
Standard Gas Products Co.

Welfare Architects.
(See Village Architects).

Welfare Equipment.
American Laundry Mchry. Co.
Crane Co.
Cutter Works, George.
Estes Surgical Supply Co.
Hill Standard Co.
Lyon Metallic Mfg. Co.
Manufacturing Equipment & Engineering Co.
Monarch Theatre Supply Co.
Perryman-Burson Co.
Puro Sanitary Drinking Fountain Co.
Sanitas Co.
Taylor, Halsey W.
Twentieth Century Brass Works
Westinghouse Elec. & Mfg. Co

Well Drilling.
Robbins, J. E.
Sydnor Pump & Well Co., Inc.

Wheels—Fibre.
(See Fibre Products).

Wheel Puller.
General Electric Co.

Whistles—Steam.
Crane Co.
Lunkenheimer Co.

Whizzers.
Tolhurst Mch. Wks.

Winders.
Firsching, J. A.
Howard & Bullough, American Machine Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Universal Winding Co.

Window Frames & Sash—Steel.
Dowman, George.
Lupton's Sons Co., David
Seawell, Luke

Window Sash—Steel.
Dowman, George.
Lupton's Sons Co., David.
Seawell, Luke.

Wires—Drop.
(See Drop Wires).

Wiring Conduits and Fittings.
See Electric Conduits.

Wiring—Electrical.
(See Electrical Contractors).

Wood.
(See Lumber).

Wood Boxes.
(See Packing Cases.)

Wood Preserver.
Armstrong Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Wood Pulleys.
(See Pulleys).

Woodworkers' Benches and Vises.
Richards-Wilcox Mfg. Co.

Woolen Machinery.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Wks.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co.
Whitin Machine Works.

Yarn Manufacturers.
American Yarn & Processing Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.
Weimar Bros.

Yarn Dealers & Comm. Merchants.
(See Cotton Yarn and Cloth Commission Merchants and Dealers).

Yarn Dyers.
(See Dyers).

Yarn Testers.
Scott & Co., Henry L.

CADILLAC PORTABLE ELECTRIC BLOWER

Attach to any light socket. Universal motor. Supplied in any voltage for 110 to 250.
For cleaning Motors, Generators, etc. For drawing dust and lint from cards, slubbers, spinning frames, napping machines, etc. Price and folder on request.

CLEMENTS MFG. CO.
612 FULTON ST. CHICAGO, ILL.

UNIVERSAL WINDING COMPANY
TEXTILE WINDING MACHINES
FEESONA

An Atlanta Office
in charge of
Winthrop S. Warren
has been opened at
1121 Candler Building

Frederick Jackson,
SOUTHERN AGENT,
Box 523, Charlotte, N. C.

BOSTON, U.S.A.
PROVIDENCE R.I. NEW YORK CHARLOTTE, N.C.
PARIS MANCHESTER BOMBAY

Please Let Us Quote You Price on

Salt

when in the Market

ROCK GLEN SALT CO.
ROCK GLEN, N. Y.

Spiker & Lose
ENGINEERS

Reports, estimates, appraisals, plans, supervision and consultation on all classes of reinforced concrete, steel and timber structures. Specialty — mills, warehouses, industrial and hydro-electric developments.

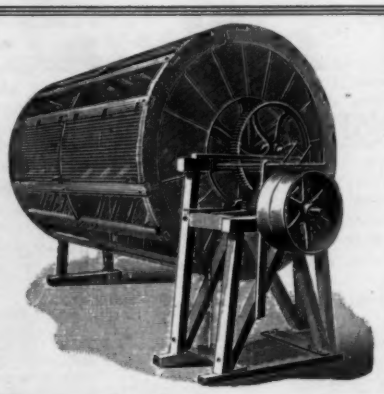
519-20 Forsyth Bldg., Atlanta, Ga.

DYE HOUSE MACHINERY

Oxidizers are built with spur gear and also with worm gear drive. Also makers of Dye Machines, Oxidizers, Tom-Toms, and dye house machinery, to specifications.

Write us.

SALEM IRON WORKS,
Winston-Salem, N. C.



ALL STEEL ECONOMY FIRE PROOF BALING PRESSES
ALL SIZES FOR ALL PURPOSES
LARGEST LINE BUILT IN U.S.A.
ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

WATER
WE-FU-GO AND SCAIFE
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

Advertisers' Index

Aldrich Machine Works 272
Allis-Chalmers Mfg. Co. 275
American Audit Co. 280
American Blower Co. ..... *
American Dock & Pouch Terminals 293
American Laundry Mchry. Co.. 19
American Machine Co., H. & B.835
American Moistening Co. 13
American Roofing & Paint Co..,281
American Scrubbing Equipment Co. 265
American Supply Co. 287
American Textile Banding Co., Inc. 870
American Water Softener Co...252
American Yarn & Processing Co. 260
Arabol Mfg. Co. 297
Arkray Mills, Inc. 277
Arlington Cotton Mills 277
Arnold Hoffman & Co. 256
Arrow Mills, Inc. 277
Atlanta Brush Co. 265
Atlanta National Bank 279
Atlanta Rubber Stamp & Stencil Works 289
Atlantic Drier & Varnish Co... *
Augusta Mill Supply Co. 293
Autogenous Welding Co. 276

Barber-Colman Co. 289
Barber Mfg. Co. 293
Barrett Co., The 833
Beer Co., H. & B. 278
Birmingham Slag Co. ..... *
Blake Electric Mfg. Co. ..... *
Borne, Scrymser Co. 262
Bosson & Lane 256
Boston Machine Works Co. ...848
Bradley Mfg. Co., A. J. 850
Brinton Co., H. 866
Butterworth & Sons Co., H. W.246

Campbell Mfg. Co. ..... *
Carlisle & Gale Co. 271
Carlyle-Johnson Machine Co...274
Carrier Engineering Corp. ...297
Carter Electric Co. 275
Carver-Beaver Yarn Co. 278
Chicago Watchman's Clock Works 846
Ciba Co., Inc. 254
Citizens & Southern Bank 279
Classified Opportunities 282 & 283
Clements Mfg. Co. 295
Cocker Machine & Foundry Co.250
Collins, J. D. 297
Columbia Novelty Mfg. Co. ..291
Commercial Acetylene Supply Co. 848
Cooper Hewitt Electric Co.... *
Corn Products Refining Co. ...261
Cortright Metal Roofing Co....297
Crane Co. 35
Cresson-Morris Co. 272
Crompton & Knowles Loom Works 22
Curtis Pneumatic Mchry. Co...273
Cutter Works, George 11
Cyclone Fence Co. 299

Davis, Roger W. 18
Davison Textile Blue Book... 20
Diamond State Fibre Co. 276
Dixon Crucible Co., Joseph .. *
Dowman, George 297
Draper Corporation 8
Dufur &Co. 281
Du Pont de Nemours Co., E. I.300

Eclipse Textile Devices 8
Economy Baler Co. 295
Electro Bleaching Gas Co. ... 40
Emmons Loom Harness Co. ..289
Ernst & Ernst 840
Estes Surgical Supply Co. ...291

Fafnir Bearing Co. 291
Famous Mfg. Co. 291
Fawcett, Hughes 277
Firsching Co., J. A. 870
Flexible Steel Lacing Co. 272
Fletcher Works 6
Flint Mfg. Co. 277
Florsheim, H. A. 277
Ford Co., J. B. 254
Foundation Co., The 39
Franklin Process Co. ..... *

Galladet Aircraft Corp'n 263
Galland-Henning Co. 846
Garland Mfg. Co. 850
General Electric Co. ..... *
General Machine Works 870
Georgia Railway & Power Co.245
Goode Construction Co. 281
Grasselli Chemical Co. 258
Gray Mfg. Co. 277
Greenville Spool Mfg. Co. .... *
Greist Mfg. Co. 14
Gude & Co. 281

Handy Equipment Co. ..... *
Harris Broom Co. ..... *
Hearne System ..... *
Hemphill Mfg. Co. 864
Hightower Box & Tank Co. .. 24
Hill Standard Co. ..... *
Hotel Martinique 285
Hotel Tuller 285
Howard Bros. Mfg. Co. 12
Howard & Bullough Mach. Co.835
Hulme, J. S. 850
Hunt Automatic Stop Motion, Inc. ..... *
Hunter Mfg. & Comm. Co. ... *
Huntington & Guerry, Inc. ... *
Hyatt Roller Bearing Co. 42

India Alkali Works 266
International Eng'g Works ... 34
International Textile Exposition 16

Johnson & Co., Oliver 38
Jordan Mfg. Co. 850

Kali Mfg. Co. 257
Keever Starch Co. 258
King, Jr., Habersham 289
Klauder-Weldon Dyeing Mach. Co. 250
Klipstein & Co., A. 260
Knit Goods Specialty Co. 848

Lane & Co., J. H. 278
Lane & Bros., W. T. 264
Lewis, John D. 870
Link-Belt Co. 30
Lockwood, Greene & Co. 272
Lombard Iron Works 289
Lowell Crayon Co. 297
Lunkenheimer Co. 15
Lupton's Sons Co., David 297
Lyon Metallic Mfg. Co. 268

Manufacturers Machine Co. .. 17
Manufacturing Equipment & Engineering Co. 269
Markem Machine Co. 21
Marshall Co., H. Newton 269
Mathieson Alkali Works, Inc...253
Merrow Machine Co. 866
Metz Co., H. A. 255
Monarch Theatre Supply Co... *
Monroe Calculating Machine Co. *
Morehead Mfg. Co. 291
Morse Chain Co. 33
Mossberg Pressed Steel Corp... 9
Myrtye Mills, Inc. 277

Nashville Industrial Corporation 283
National Aniline & Chemical Co. 1
National Association of Box Manufacturers 25
National Bank of Commerce In New York 280
National Shawmut Bank 278
New York & N. J. Lub. Co....272
Newport Chemical Co. 842
Norwood Engineering Co. 252

Packard Motor Car Co. ..... *
Palmer Co., I. E. 268
Parks-Cramer Co. 10
Parkdale Mills, Inc. 277
Patterson-Sargent Co. 2
Pearson, Jos. T. 870
Permutit Co. 249
Perryman-Burson Co. 267
Phila. Drying Mchry. Co.....251
Pickens Slasher Hood Co., R. O.252
Powers Regulator Co. 248
Proctor & Schwartz, Inc. 250
Puro Sanitary Drinking Fountain Co. 267

Reliance Machine Works 863
Richards-Wilcox Mfg. Co. 270
Robbins & Sons, J. E. 281
Robert & Co. ..... *
Rock Glen Salt Co. 295
Roessler & Hasslacher Chemical Co. 852
Roy & Sons Co., B. S. 22
Rundle-Spence Mfg. Co. 263

Saco-Lowell Shops 18
Salem Iron Works 295
Sanitas Co. 287
Sanymetal Products Co. 271
Sargent's Sons Corp., C. G. ...248
Scaife & Sons, Wm. B. 295
Schaum & Uhlinger 6
Schofield Sons Co., J. S. 276
Schofield Co., Wm. 291
Scott & Co., Henry L. 842
Scott & Williams 857
Seawell, Luke ..... *
Shambow Shuttle Co. 850
Signode System, Inc. ..... *
Sirrine, J. E. ..... *
S. K. F. Industries 29
Slaughter Machinery Co., G. G. ..... *
Smith & Furbush Machine Co.263
Sonneborn Sons, Inc., L. 251
Southern Bending Co. 18
Southern Brush & Broom Co...266
Southern Cypress Mfg. Asso... 37
Southern Distributing Co. ...254
Southern Railway System 280
Southern Spindle & Flyer Co...263
Southwestern Broom Mfg. Co.263
Spiker & Lose 295
Stafford Co. 7
Staley Mfg. Co., A. E. 256
Standard Fibre Co. 285
Standard Gas Products Co. ...276
Stearns, Wm. Taylor 870
Steel Heddle Mfg. Co. 262
Sturtevant Co., B. F. 4
Surpass Chemical Co. 262
Swan & Finch ..... *
Sydnor Pump & Well Co., Inc.281

Taylor Co., Halsey W. 269
Taylor Instrument Co. 289
Terrell Machine Co. 846
Texas Co. 26
Textile Finishing Mchry. Co...298
Textile Hall of Greenville ... 23
Tolhurst Machine Works 247
Toomey, Frank, Inc. 282
Transmission Ball Bearing Co.293
Tropical Paint & Oil Co. 293
Truitt Coal & Iron Co. 281
Tufts Co., Arthur 836
Twentieth Century Brass Wks.268

United Chemical Products Co...287
Universal Winding Co. 295
U. S. Ball Bearing Co. 32
U. S. Fuel Corp. 291

Vogel Co., Jos. A. 270
Vonnegut Hardware Co. 36

Wadsworth, Howland & Co., Inc. ..... *
Walke Box Co., Inc. 850
Walraven Co., The 266
Walsh & Weidner Boiler Co...274
Want Ads 282
Warren Soap Mfg. Co. 839
Weimar Bros. 277
Westinghouse Electric & Mfg. Co. ..... *
Westinghouse Lamp Co. 27
White Co. .....
Whitinsville Spinning Ring Co.264
Whitin Machine Works 7
Whiton Machine Co., D. E. ...274
Wildman Mfg. Co. 858
Williams & Sons, I. B. 28
Wolf & Co., Jacques 260
Wood's Sons Co., T. B. 31
Woodward Baldwin & Co. 277

Zavon, Inc. 259

ARABOL SIZING TALLOW

This is an especially prepared tallow for softening all counts of cotton yarns. We absolutely assure you it will produce any amount of softening desired. In addition to this it will prevent any sticking of yarn to the slasher cylinders and also cause the yarn to open perfectly at the lease. On light pick goods it can be used alone, however we recommend the use of our Gum G in connection with it on goods of 48 picks or more. To be used on either white or colored goods.

Arabol Manufacturing Company

100 William Street, New York City

LOWELL CRAYONS

Made in 15 different colors and white.

Used by all first-class textile mills, because they are worth their cost. The constituents are such that produce desirable results. Do not leave stains.

LOWELL CRAYON CO.
Lowell, Mass.
Trade Mark on Every Box.

Carrier Engineering Corporation

750 FRELINGHUYSEN AVE, NEWARK, N. J.

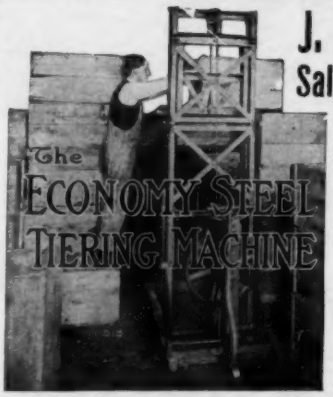
Boston Buffalo Philadelphia Chicago New York

AIR CONDITIONING
(Manufactured Weather)

HUMIDIFICATION CLEANING
WINTER HEATING SUMMER COOLING

We will be glad to tell you why and how nearly two hundred of the finest mills in the U. S. are making "Every day a *good* day" with

CARRIER EQUIPMENT



J. D. Collins Sales & Eng'g. Co.

STORAGE AND INDOOR TRANSPORTATION EQUIPMENT

926 Grant Building, Atlanta, Ga.

Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of al kinds.

Catalogs and full information furnished upon request

Lupton

INVESTMENT VALUE

STEEL SHELVING

Tool Stands,
Tool Cabinets,
Pressed Steel,
Bench Legs, etc.

Ask for Catalogue C

David Lupton's Sons Co.
Amber St. & Allegheny Ave.,
PHILADELPHIA, PA.

GEORGE DOWMAN

200 NATIONAL CITY BUILDING,

ATLANTA, GEORGIA

We Are Prepared To Furnish

FIRE DOORS AND WINDOWS OF ALL TYPES
ORNAMENTAL IRON WORK
OVERHEAD CARRIER SYSTEMS
SKYLIGHTS, VENTILATORS
METAL SHINGLES AND CEILING
TOILET PARTITIONS—METAL STAIRS

Contracts Taken for Complete Installations

CORTRIGHT METAL SHINGLES

Here's Why You Will Prefer Cortright Hand Dipped Galvanized Tin Shingles

Each shingle, first formed of prime Roofing Tin, is coated separately in a zinc bath and receives about twice the amount of zinc found on galvanized shingles.

Of course, we make both kinds—we also make them of Tin, Painted Red or Green and Pure Zinc. But where a galvanized shingle is preferred, order Cortright Hand Dipped Shingles. We'll send our book, "Concerning That Roof."

CORTRIGHT METAL ROOFING CO.
Philadelphia — Chicago

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
HUDSON TERMINAL BLDG.

THE TEXTILE-FINISHING MACHINERY CO

CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C.

Your Inquiries Solicited for

MACHINERY

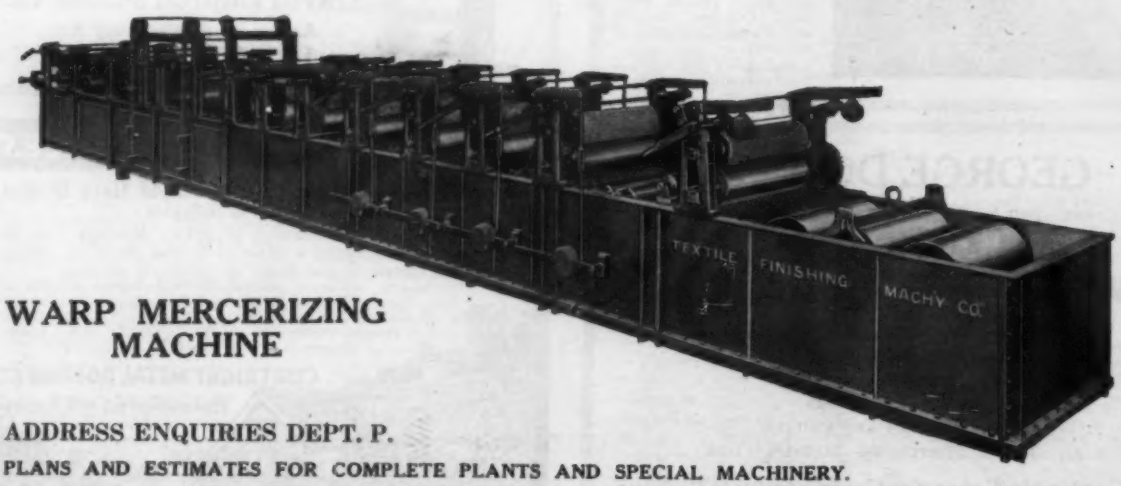
of All Kinds and Types for Bleaching, Dyeing, Drying

Mercerizing and Finishing Piece Goods and Warps

—o—

Our Specialties Are:

Upright and Horizontal Dryers, Warp Mercerizing Machines, Singers, Kiers, Washers, Squeezers, Scutchers, Dye Jiggs, Mangles, Calenders, Tenters, Color and Size Kettles, Warp Dyeing Machinery, Elastic Web and Narrow fabric Finishing Machinery, and Calender Rolls of Cotton Husk, Paper and Patent Combination Stock.

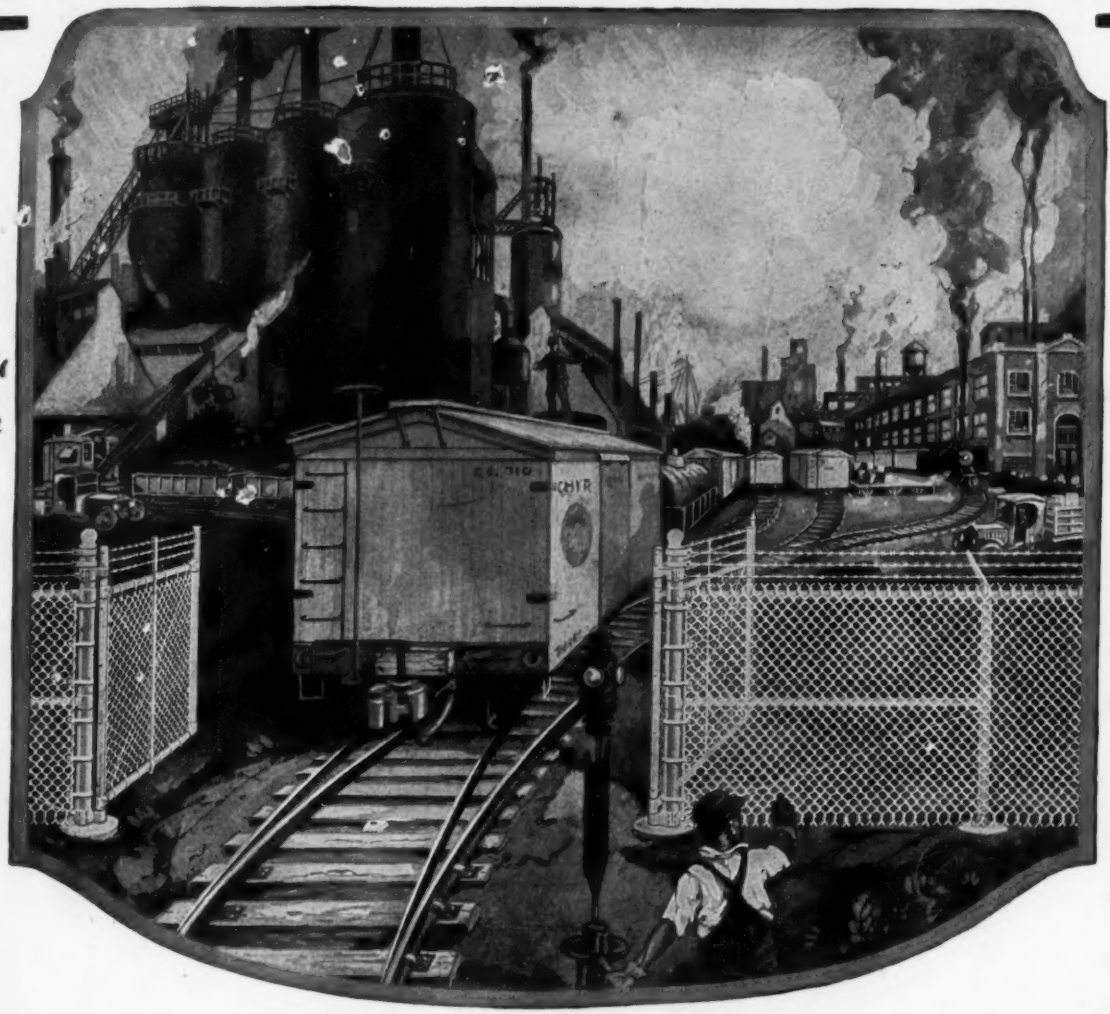


WARP MERCERIZING MACHINE

ADDRESS ENQUIRIES DEPT. P.

PLANS AND ESTIMATES FOR COMPLETE PLANTS AND SPECIAL MACHINERY.

CYCLONE FENCE



YOUR INCOME AND OUTGO THROUGH CYCLONE GATES

Checked in and checked out. No guess work; everything accounted for; no loss.

From the moment raw materials and operating supplies enter your factory yards until they reach the stage of out-going, sold products—all have dependable protection when your property is enclosed with Cyclone Fence.

Protection for your money invested in operating materials and other property is just as important as the safeguards surrounding the coming and going of your funds. Stolen and damaged materials, like stolen dollars—mean LOST dollars.

Cyclone Fence prevents thefts and destruction of property; makes all territory enclosed a safe storage area; centralizes entrances and exits; gives you control of the coming and going of men, money and materials.

Now is the time to enclose your factory property with Cyclone Fence. By installing Cyclone Fence now, instead of waiting until frost time, you will save money on installation costs.

Let us know your fence requirements. Proposals, advisory service and literature furnished without charge or obligation.

Look for the "Red Tag" the Mark of Quality

Phone, Wire or Write General Offices, Waukegan, Ill., or Branch Offices Nearest You

CYCLONE FENCE COMPANY, Waukegan, Illinois

Factories: Waukegan, Ill. Cleveland, O. Fort Worth, Texas

Branches: **Chicago, Minneapolis, St. Paul, Indianapolis, Detroit, Rochester, Philadelphia, New York, Baltimore, Kansas City, Oakland, Portland, San Francisco, Los Angeles**

A corner of the Du Pont Research Laboratory at Deepwater, N. J.

The Birthplace of Hundreds of American Dyes

HERE, in this completely equipped research laboratory, the very heart of our large Deepwater Works, have been made the thousands upon thousands of intricate experiments that have resulted in the production of hundreds of different colors for the benefit of America's dye-consuming trade.

Here today, tomorrow and in the days to come, other thousands of experiments will be made in order that the forty representative industries of the country who use dyestuffs may eventually secure *every* color their products require, in ample quantity and in quality that is second to none.

The making of dyestuffs, the most complex of all industries, requires not only great resources, but vast chemical knowledge. It is fitting, therefore, that the Du Pont Company, with over a century of accumulated chemical experience, should assume a large portion of the burden of providing the United States with a self contained dye-making organization.

E. I. du Pont de Nemours & Co., Inc.

Dyestuffs Department

WILMINGTON, DELAWARE

Branch Offices

New York Boston Providence
Philadelphia Chicago
Charlotte, N. C.

DU PONT DYESTUFFS